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The Journal of Neurology and Psychopathology

Edited by

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THE JOURNAL OF NEUROLOGY AND PSYCHOPATHOLOGY.

Vol. IX. OCTOBER, 1928. No. 34.

Original Papers.

INFLUENZA IN RELATION TO THE ONSET OF ACUTE PSYCHOSES.

By T. C. GRAVES, Birmingham.

(Chief Medical Officer, the Birmingham Mental Hospitals.)

INTRODUCTION.

Sir George Savage[1] considered that of all the infectious diseases influenza is the most likely to be followed by mental disorder. This as a rule is of a favourable type, but it is not infrequently the starting point of final dissolution.

The most dangerous ages are early youth and critical periods such as the climacteric and the puerperal condition. Harris,[2] discussing influenza as a factor in the causation of psychoses in a paper based on the study of 18 cases observed by him in Massachusetts, found that the psychosis bore no relation to the character of the influenzal attack, being liable to occur after mild as well as after severe attacks. The symptoms in most cases developed in less than two weeks after the febrile period, but in some cases might not appear for three months. Delusions and hallucinations were the commonest symptoms in this series, being present in ten of the 18 cases. Depression was the most pronounced symptom in only three cases, whereas excitement and destructive tendencies were present in 14. Although any form of psychosis may result, dementia was the commonest in this series, being found in eight cases. The average age of the patients so diagnosed was 27 years. Pierce and Wilson,[3] reviewing the observations made on the subject in 1919, quoted the work of Menninger[4] who found that apart from the febrile deliria there is an interval of from two to eight days between the termination of the influenza and the onset of the psychosis. They found many writers were convinced that there is always some latent predisposition. All seemed to agree that the type of influenza has nothing to do with the resulting psychosis. Weber[5] noted delirious states with motor agitation and hallucinations; these developed within four to ten days. He considered the prognosis was good. Pierce and Wilson stated that their experience was much less fortunate. A large number of cases were under treatment presenting marked motor agitation, very vivid hallucinations of sight and terrifying delusions. In some cases there were also both auditory and olfactory hallucinations. The associated

type of influenza varied. Bronchopneumonia was present in many of the cases but the severity of the symptoms was out of all proportion to the physical signs found. No instance of recovery was recalled.

It appears to be an agreed observation that the character of the influenzal attack bears no relation to the character of the ensuing psychosis; further, it has been noted that there is no parallel between the extent of the affection of the lungs which may occur and the severity of the mental symptoms.

The lungs are not, however, the only part of the respiratory tract which becomes involved in influenza. The infection begins in the upper respiratory tract and may especially affect those cavities lined with mucosa which are inside the skull and adjacent to, but outside, the immediate brain case—the nasal sinuses and the middle ear. After recovery from the more general symptoms the infective process may persist in a chronic form, showing periods of exacerbation and remission with corresponding recrudescence of symptoms, both local and general, and producing pathological changes in other parts of the body.

Influenza and the accessory sinuses of the nose is discussed by Fraenkel[6] in a paper based on post-mortem examinations of 60 cases. In only 16 cases were the sinuses found to be intact—in other words, they were implicated in about 75 per cent. Forty-seven of the cases occurred in males and 13 in females. The third decennium was chiefly affected (27 cases). The sphenoidal sinus was most frequently involved, in 12 cases by itself; in 15 cases with the antrum of Highmore on one or both sides; in eight with the antrum and frontal sinus. The antrum was next most frequently attacked, in eight instances independently of any other sinuses. The frontal sinus was only once affected independently. The character of the morbid process was almost exclusively an exudation, often of a hæmorrhagic nature. Hæmorrhagic effusion was found in 13 of the 35 cases of sphenoidal sinus disease: nine times in the antrum and three times in the frontal sinus. Purulent exudation was only slightly less frequent, being found 11 times in the sphenoidal sinus and antrum cases respectively and three times in the frontal sinus. Serous effusion was decidedly rarer, being present five times in the sphenoidal sinus, eight times in the antrum and never in the frontal sinus. In a smaller number of cases the sinuses contained mucus. Sometimes the diseased sinus contained no fluid and the morbid process was then only shown by the œdematous appearance of the normally thin and transparent lining of the sinus. On bacteriological examination, B. influenzæ was easily found in 22 cases, but in only five in pure culture; in all the rest other micro-organisms were present, such as streptococci and pneumococci.

Similar evidence as to the frequency of involvement of the nasal sinuses in influenza is given by Gerber[7] of 210 cases of frontal sinusitis of which the causation could be established; a "cold" was given as the cause in 91 cases, influenza in 61 cases, and all other acute and chronic infections, injuries, etc., in

58 cases. Influenza, therefore, apart from "colds," accounts for 29 per cent., and this figure should probably be higher, as a "cold" is very often really influenza.

Milligan[8] draws attention to the effects of influenza in producing an acute hæmorrhagic type of reaction in the external, middle and internal ear and mastoid antrum. He notes in cases of influenzal mastoiditis of the fulminating or destructive type that headache is especially severe, the initial temperature unduly high and the patient's mentality unduly depressed or exalted—a condition he considers due in all probability to a concomitant and sudden increase of intracranial tension, or, in other words, to a serous meningitis.

During the first quarter of 1927 an epidemic of influenza occurred and was responsible for the largest number of deaths from this disease in England and Wales in any first quarter since 1919, when the terrible pandemic occurred. The return of deaths in the city of Birmingham shows during this period a rapid increase for those attributed to influenza, bronchitis and pneumonia. The deaths from influenza, which during the first three weeks of January had been in single figures, rapidly rose during the following weeks to a maximum of 57 and then gradually fell to single figures during the first week of April. During this period many cases of acute psychosis were admitted to the mental hospitals with histories of influenza; and in the remaining months of that year, and in early 1928, cases were admitted from whose histories and clinical correlations it could be deduced that the influenzal epidemic of 1927 had played a part in initiating or precipitating their psychoses.

Cases are still met with where the onset of symptoms leading eventually to a certified mental state began during the influenza pandemic or subsequent epidemics of the early twenties.

CLASSIFICATION OF CASES.

The cases where influenza was known to be a factor in the causation of psychoses fall into two groups in relation to the onset of psychosis and the attack of influenza, viz., (1) the immediate, and (2) the delayed group.

The Immediate Group.

In the cases of this group a very definite connection with an influenzal attack was traced. The group can be subdivided into three sub-groups in regard to their state on admission.

(A) Profound general toxæmia predominant.
(B) Toxæmia and mental symptoms both marked.
(C) Mental symptoms the predominant condition.

(A) *Profound General Toxæmia predominant.*

On admission the cases so classified showed a mental state of delirium and symptoms of profound intoxication especially affecting the circulatory system. Three cases are submitted illustrating this class. The second and third

are cases where the septic products were unable to escape freely from the nasal sinuses. This "closed" sepsis was found associated with a persistence of mental symptoms after the alleviation of the general toxæmia and the subsidence of the delirious state. It was more serious in the second patient, and associated with this was the exhibition of more intense mental symptoms, especially before the "closed" sepsis had been converted by operation into "open"; the stimulus of non-specific protein therapy was also afterwards required before recovery ensued

CASE I. Under the care of Dr. Kathleen A. H. Sykes. M. E., housewife, age 53. Admitted January 31, 1927. First attack.

Previous History.—No psychotic heredity. Between the ages of six and ten the patient was subject to periods of transient confusion, a dreamy state with loss of power over limbs. Later, health good. Happily married. Two children, alive and well. No miscarriages. Menopause about 50, no loss or discharge since. Always bright and appetite good. Had an attack of sciatica in 1926.

Clinical History.—Three weeks before admission she had influenza and laryngitis (all the family developed influenza) and a week later became "rather excitable." The excitement grew worse, she became uncontrollable, threatened suicide by cutting, imagined a plot against her, asserted her husband was the ringleader of the plot and took a strong dislike to him; she raved and screamed.

State on admission.—Profound toxæmia with complete confusion and excitement. Continually rolling head from side to side and shrieking. Wet and dirty. Tongue very dry, cyanosed and cracked; fauces inflamed and cyanosed; deep cracks in lower lips; pharynx dry, the mucosa glazed, strings of inspissated mucopus stretching from wall to wall. Swabbing the throat brought away green pus. Temperature 97·2: resp. 20; pulse 96 and feeble. Heart dilated, sounds very feeble, mitral systolic murmur. B.P. 132/100. Peripheral circulation poor. Lungs, scattered rhonchi. Nervous system and urine normal. Blood: Wassermann negative. Gynæcologically: chronic septic cervicitis.

Clinical Course.—Antistreptococcal serum and collosol calcium were injected during the days following admission. After the third injection the patient gradually became calmer, the head rolling and shrieking ceased and the mouth and throat became moist. The treatment was continued and on February 7 she regained normal consciousness. Thereafter she continued to improve, aided by bowel irrigations, ultra-violet light and local gynæcological and nasal and throat treatment. Chronic nasopharyngeal sepsis was found on nasal examination.

By the commencement of March she appeared to have made a complete mental recovery. Blood pressure 174/120. Appetite good. Slept well, no dreams. Facial colour and hearing good. Discharged recovered, March 10, 1927.

October, 1927. Very fit and well.

May, 1928. Still keeping well; had some sciatica during the past winter. Sleeps well, appetite good. Blood pressure maintained at levels on discharge.

In this case the influenzal infection produced an exacerbation of an existing chronic nasopharyngeal sepsis with involvement of the nasal sinuses, resulting in the production of a hyperacute toxic confusional state. The sinusitis was undoubtedly directly associated with the head movements. The toxic process caused a fall of blood pressure which rose to its usual figure on recovery, and has remained so since discharge. There was no very marked pulmonary condition on admission to account for the toxæmic state, which was

the result of an intensification of a chronic " open " septic state of the mucosæ of the upper air passages, and was relieved by serum treatment.

CASE II. Under the care of Dr. Kathleen A. H. Sykes. E. S. R., female, married, age 37. Admitted February 7, 1927. First certification.

Previous History.—No psychotic heredity. Childhood normal. Became a forewoman in machine shop, where she did well, later married. Two children. No miscarriages. Had had " influenzal colds " not severe enough to require stay in bed. Not alcoholic.

Clinical History.—Been working hard looking after family. Teeth had been getting bad for some time, but she refused to have them seen to. During month preceding admission lost weight. Became depressed, dreamy and apathetic. Acute mental symptoms developed a week before admission and at the time when the influenza epidemic was prevalent. Became confused ; suffered from visual hallucinations ; was terrified, talked nonsense loudly, mistook identities, struggling and violent. Sleep bad last four days.

State on admission.—Menstruating profusely ; the acute symptoms necessitating certification therefore developed coincident with the premenstrual phase.

Complete confusion. Apathetic, depressed. Speech, a rapid inconsequent muttering. Apparently the subject of auditory and visual hallucinations. Resistive to nursing attentions. Impulsively violent to those around her. Seriously ill. Phlyctenular conjunctivitis (left). Heart dilated, sounds soft and poor quality, mitral systolic murmur. Regular but feeble pulse rate, 82, later becoming 100 to 120. Intensely pale. Temperature normal. A few scattered rhonchi in lungs. Tongue dry. Ulcerated septic gums. Superficial ulceration of congested soft palate, especially left side. Septic roots under a denture. Bilateral ptosis, worse on the left. Wassermann negative.

Later it was found that the uterus was partially retroverted, chronically subinvoluted, and from the cervix came a thick, curdy, mucopurulent discharge.

Clinical Course.—Antistreptococcal serum mitigated the symptoms of profound toxæmia. Septic roots and carious teeth extracted at intervals. Gynæcologically treated with antiseptics. Ear, nose and throat examination.—Tonsils, pus in both ; post-nasal space, pus on left side ; ears, both drums showed scar of an old healed perforation. Transillumination of sinuses : right antrum dim ; left antrum black ; frontals clear. Anterior rhinoscopy : wet septic nose.

She was still very ill and general treatment was carried on. Later a general sinus examination, with the use of Watson-Williams suction syringe technique, gave the following results : mucopus in right sphenoid ; mucopus in left ethmoid ; from the left antrum pus escaped under pressure.

The left antrum was drained intranasally. Convalescence from operation was satisfactory and the patient began to show definite physical improvement so that she was able to be up and about. Catamenia which had been in abeyance returned. She said her head felt clearer but she was still, though less, confused. She showed slow physical and mental improvement but was able to go out on parole with friends. She gained weight but sleep was variable. At times she showed impulsive behaviour.

Although tonic treatment was continued the next menstruation was missed and mentally she appeared stationary ; auditory hallucinations were evidently still present. Apparently did not recognise her children.

The " closed " sepsis had now been converted into " open " and therefore recourse was had to non-specific protein therapy to provoke a focal reaction. T.A.B. was given intravenously. A good reaction was obtained, temperatures up to 104·6°, herpes around lips and nose, and such severe pain in back that no more injections were given. From thence onward a definite mental improvement ensued. Catamenia returned, followed by further physical and mental improvement, and thereafter continued regularly. She showed a gain of two stones on admission-weight. Colour good. Blood pressure, which before operation had been 114/78 recumbent, was now 132/80 recumbent. Eyes clear ;

only a few dilated vessels in left conjunctiva. Conduct, manner, conversation normal. Insight gained into her case. Able to describe her auditory and visual hallucinations without embarrassment. Said her mind became definitely clear a week after T.A.B. treatment and that at the menstruation following she had a "moving-about sensation" in her head and after the completion of the period her head felt clearer.

Discharged recovered after a satisfactory month's trial, January 1928. Subsequent mental progress satisfactory.

In this case the patient was in a state of profound toxæmia precipitated by an attack of influenza, although there were no sudden acute influenzal symptoms as generally shown by a healthy person. There was a history, however, of repeated "influenzal colds." Such influenzal symptoms as might have been present were probably rapidly succeeded by the development of the acute delirious hallucinated state, the symptoms of which were intensified by the premenstrual phase of the menstruation present on admission. The septic roots (covered by a denture) were doubtless responsible for the antral disease, and upon this gradually progressive chronic septic condition an influenzal infection was superimposed.

In this case also there was no parallelism between the pulmonary condition and the mental symptoms displayed. The causation of the toxæmic state was in the skull and, although the serum undoubtedly mitigated the intensity of the toxæmia, recovery did not ensue until "closed" sepsis in the nasal sinuses had been opened and drained, and a focal reaction (indicated by the herpetic reaction) induced by non-specific protein therapy.

Case III. Under the care of Dr. Jane W. Stocks. E. A. B., housewife, married, age 29. Admitted April 27, 1927. First certification.

Previous History.—No psychotic heredity. Four brothers and one sister alive and well. Non-alcoholic. Always of a nervous disposition. Happily married. No domestic worries. No miscarriages.

Clinical History.—Instrumental delivery of her first child nine and a half months before admission to mental hospital. Suckled the child. Later developed insomnia.

Contracted influenza, February 1927, followed by pneumonia and pleurisy; became depressed, later excited and talkative; expressed persecutory ideas, with evidence of auditory hallucinations. On account of pleuritic effusion was admitted to a general hospital but mental state became such that certification was necessary. She was rambling, laughing in a strange way, singing almost continuously; she imagined she saw a lion, an octopus and a peculiar kind of fowl in the ward.

State on admission.—Weight 6 st. 4 lbs.: very poorly nourished, and pale. Very seriously ill, yet resisted nursing observations and attention. Temperature 100·4°. Cardiac sounds faint and distant, no murmurs; pulse irregular, fairly well sustained; poor peripheral circulation.

Pleuritic effusion to lower angle scapula on left side. Bronchitis and dry pleurisy at base, right. Tongue dirty, gums unhealthy, some decayed and septic teeth.

Pupils reacted to light and accommodation; no nystagmus, plantars flexor, deep reflexes brisk. Kernig absent. Clonus both ankles. Muscular tone poor. Abdomen nil. Urine, sp. gr. 1030; acid reaction. Slight trace of albumen. Blood: Wassermann negative. Widal negative to all groups.

Noisy, excited, restless, exalted, attention not held, appeared to appreciate simple questions but replies wandering. Triple disorientation. Alternately burst into tears and song. No insight. Judgment lost. Fleeting delusions.

Clinical Course.—During the last days of April and first week of May the temperature varied between 97° and 99·8°, pulse up to 108; later, the temperature became persistently subnormal.

By the middle of May the patient was on the whole quieter, but physically she regressed. Chest condition remained much the same. Some foul bloodstained stools were passed.

By the end of May, some slight physical and mental improvement was noticed, but she was still confined to bed. At the end of the first week in June improvement maintained; she was less confused, quieter and sufficiently amenable for a gynæcological examination. An acute inflammation of vulva, vagina, Bartholin's glands and cervix was found with a mucopurulent discharge. The condition suggested gonorrhœa but the bacteriological findings were negative. Antiseptic dressings applied.

By the beginning of July she showed gradual improvement but would only answer simple questions in monosyllables. Still confused, memory impaired; said she was not married and had no memory of where she was before admission. Physically much improved, gained weight, colour better and chest condition had cleared. Dental treatment and actinotherapy given. Progress continued slowly but she appeared to be stabilising into a chronic state.

A review during the early part of October showed slow thought processes, orientation fair; she realizes she has been ill and confused ("mithered") and displays some appreciation of her present condition. Is troubled with a "voice" in the right ear, realizes it is not real but it is a source of worry. Her head is heavy, as if there were a ton weight on the top. At times has a bad headache and then the weight sensation gets worse and passes on to the back of the head. Appetite good, bowels regular and sleep is better. States she has been subject to colds from a child, used to get constant "sore throats," has had them so bad that she could not swallow. Willing to have her tonsils removed.

The ear, nose and throat condition was as follows: chronic follicular tonsillitis especially marked on right side. Wet septic nose. Retraction of both membranæ tympani. All sinuses dim on transillumination, especially right antrum.

On October 21, 1927, under general anæsthesia, she was operated on. Tonsil dissection: both very adherent. Adenoids: a large pad removed. General sinus examination, with the Watson-Williams suction syringe technique: sphenoidal sinuses, hæmorrhagic returns; antra, pus in left antrum.

On November 9, 1927, the following notes were made: throat satisfactory. Albumen nil. B.P., recumbent, 118; sitting 112; standing 120. Weight 9 st. 1 lb. Mentally a considerable improvement. The "voice" has gone completely, no buzzing in ears, no dizziness or headaches, weight on top of head has gone and head feels lighter. Volunteers that her vision is better. Her responses are brisker and her facial expression (previously fixed and puzzled) is now normally mobile.

November 10, 1927. Sent out on trial in care of relatives.

December 8, 1927. Doctor's, visitor's and relative's reports satisfactory. Discharged recovered.

May 1928. Visitor's report. Interviewed patient and her sister. Sister stated her condition was very satisfactory in every way. Appetite, sleep and weight satisfactory. She was bright and contented. Menstruation (which had been in abeyance during her stay in hospital) started in December 1927, and had been regular since. Had had a very mild attack of influenza this year, lasting only two days.

In this case the influenzal infection was responsible for an acute exacerbation of a pre-existing septic infection in the upper respiratory tract and its extension to the nasal sinuses, producing a hæmorrhagic type of reaction in the sphenoidal sinuses and a purulent type in the maxillary antrum. Associated was a bowel infection, responsible for the foul hæmorrhagic stools; there was also an acute infection of the lower genital tract.

The patient presented a picture of a massive infection of the mucosæ of the alimentary, genital and respiratory tracts, the latter involving also the pleuræ. With the subsidence of the inflammatory states in the trunk there was also a relative improvement of the inflammatory process in the mucosæ of the nasal sinuses, which did not however return to the status obtaining before the onset of the influenzal attack. Parallel with the subsidence of the acute processes there was an improvement in the general physical health and a reduction of the acute delirious hallucinated state to one of quiet subacute confusion with persistence of hallucination, although in lowered intensity, together with headaches and head pains. These latter symptoms varied, and it is probable that these variations were dependent on other exacerbating factors, such as the phases of the reproductive cycle, in her case moliminial reactions.

A certain stabilization had now been reached but the balance was insecure and with the onset of winter it would be reasonable to expect a re-intensification of symptoms. The removal of the septic foci in the head was followed by the disappearance of these residual symptoms and the patient became more stable at a higher mental as well as at the physical level.

(B) *Toxæmia and Mental Symptoms.*

This group is illustrated by two cases, admitted during the influenzal epidemic with definite histories of influenza; they showed some general toxæmia, not profound as in those of the previous group. The circulatory disturbance was much less and mental as well as general toxæmic symptoms were prominent in the clinical picture.

The general state presented by these cases was similar to that of the last two cases after the subsidence of the profound toxæmia and before the treatment of the focal sepsis. In one, antistreptococcal serum produced no improvement.

Case IV. Under the care of Dr. J. M. Mackenzie. H. D. O., male, storekeeper, single, age 20. Admitted March 8, 1927. First certification.

Previous History.—No psychotic heredity. Patient was an eight months' child. Standard VII at 14. Always a steady worker.

Clinical History.—Indefinitely ill for eight months before admission. Lost weight. Influenza six weeks and mental symptoms a week before admission. Sat alone in the dark, lost interest; insomnia; heard imaginary people making noises outside. Exalted, grandiose ideas, talkative, restless, laughing and crying.

State on Admission.—Mental State. Confused, irresponsible, exalted, suspicious. Muttering. Vivid auditory and visual hallucinations. Flight of ideas. Grimacing and attitudinising, rolled his head about, turned it more constantly to left. Food refusal, spoon feeding and constant attention required.

Physical State. Temperature 98·2°; pulse 76; resp. 18. Height, 5 ft. 6¾ in.; weight, 8 st. 11 lbs. Viscera showed no organic disease. Tonsils enlarged. Carious teeth. Bilateral ptosis, more on left. Wassermann negative.

Clinical Course.—Abscessed carious teeth removed. Radiogram of sinuses—clear. Remained as before, but weight rose. Antistreptococcal serum produced no improvement. Later his weight fell.

Ear, nose and throat examination.—Ears: normal. Anterior rhinoscopy: a chronic atrophic rhinitis of middle degree. Nasal sinuses: antra both dim, right more than left. Frontals equally dim. Nasopharynx: mucopus on posterior wall. Adenoids. A general nasal infection was present extending to pharynx and fauces.

May 8, 1927. General sinus examination with Watson-Williams suction syringe technique gave evidence of infection of left antrum and right ethmoid. Adenoids removed and tonsils by dissection.

Immediately after recovery from operation he began to talk sensibly, grimacing and attitudinising ceased, became amenable to nursing. Ultra-violet light now given.

By the middle of June, much improved, worked in grounds, well orientated, conduct normal. Some left ptosis still present.

June 19, 1927. Under local anæsthesia: washout left antrum, clear.

July 9, 1927. Weight 10 st. 1 lb. Feels well, looks well, no hallucinations, conduct normal, works well, shows initiative and interest. Has gained insight into illness and states that when he heard the "voices" they appeared to be in the left ear.

July 14, 1927. Discharged: recovered.

February 1928. Visitor reports mental condition quite normal; no "voices"; even-tempered, good spirits, sleep and appetite good.

CASE V. Under the care of Dr. J. M. Mackenzie. W. H. P., male, married, brass polisher, age 22. Admitted on February 17, 1927. First certification.

Previous History.—Family: no insane relatives known. Personal: In later childhood and adolescence was subject to frequent illness, "always under the doctor" for, amongst other complaints, "attacks of pain in the head and bilious turns" from the age of 11. At 14, double pneumonia. Although his later school career was marred in this way he nevertheless reached Standard VI before leaving school. Later he appears to have been a good workman, earning up to £4 a week at metal work. His wife reported that as regards health "he had always been a lot of trouble" with bad teeth, jaw abscesses and "all sorts of skin troubles," and in her view he "used to drink a lot."

Clinical History.—During autumn, 1926, he developed boils on the back of the neck, followed at the beginning of November by a bad attack of influenza. As a consequence of this he lost weight, "went like a skeleton," and was away from work for several weeks. He recovered to the extent that he was able to go back to work before Christmas 1926, but after Christmas was unable to continue. Complained of pains in head and insomnia; sat holding his head, apathetic, neglectful; did nothing, would not go to doctor to get panel note. Was to have gone to dentist but refused to do so. At time of influenzal epidemic, February 1927, his condition became worse and certification became necessary.

State on admission.—MENTAL STATE. Stupor, confused, totally indifferent to surroundings, immobile facies, no variation of emotion or interest except perhaps a certain degree of suspicion or fear shown by moving the head away a little when approached. Negativistic, did not speak, made no signs, refused food and required spoon feeding, would not pass urine unless enema given.

Resistive to examination and nursing attention.

PHYSICAL STATE. Temperature 97·6°. Pulse 70. Weight 9 st. 5 lbs. Pale complexion, thin and ill-nourished. No enlarged lymph glands. Peripheral circulation poor. No œdema. Heart: limits normal; sound normal at apex. A semi-musical diastolic murmur replacing the second sound all over the sternum, heard best at third interspace at right sternal border. Pulse: Corrigan type. Lungs: impaired percussion with crepitations at right anterior apex. Tonsils inflamed, mucopus on posterior pharyngeal wall coming from nasopharynx. Palate injected. Teeth carious and roots. Pyorrhœa. Right-sided ptosis. Urine normal. Blood: Wassermann negative. Widal: negative.

Clinical Course.—Five carious teeth and roots removed. Continued stuporose, resistive and resented nursing attention. Habits faulty by day and night if not raised frequently. Much time and patience required for spoon feeding. Bowels, irrigations every second day. Did not recognise his wife at her visits.

May 11, 1927. Ear, nose and throat examination. Very resistive; after much difficulty the following observations were made. Ears: normal. Tonsils: both enlarged, especially right, and septic. Antra: both dim, especially right. Frontals: right dimmer than left. No pus seen anteriorly in nose.

May 25, 1927. General anæsthesia. Tonsil dissection. Right tonsil: deep abscess present; no sign of its presence on the surface. Left tonsil: septic and adherent to capsule. General sinus examination, Watson-Williams technique. Sphenoids: right, nil; left, mucopus. Antra and ethmoids: nil.

Convalescence uneventful. Colon irrigations continued. During summer months began to improve; muscular and facial tone and colour improved. Able to be up and about but progress slow and gradual. Speech began to recover, at first by grunts indicative of assent, later on occasion "yes" and "no" could be elicited and at times commands would be obeyed in a slow sheepish manner. Unable to state where he was.

During this stage he displayed mannerisms when addressed, constantly fidgetting, continually running his right hand through his hair in a puzzled and agitated manner; later the hand only reached his necktie, which he would partially but continually tighten. Later the hand came lower, fidgeting with the waistcoat. This display of agitation subsided later. Colon irrigations were continued. In the autumn ultra-violet course commenced and a short course of T.A.B. vaccine intravenously. Temperatures up to 104·4° F. were obtained with rigors and vomiting; pulse up to 100 and 120.

On October 5 the Charge Male Nurse reported the beginning of a definite improvement. "Has shown remarkable improvement to-day. Responded correctly to questions regarding orientation and is generally 'awake' to his surroundings." From thence onward progress was gradual.

Review at the end of 1927.—Weight 10 st. 11 lbs. Correctly orientated. Does not remember admission. Knows he was ill, too ill and too confused to know what was happening to him. Gives the following details of his own history. For two years before admission he suffered with pains in the head and "bilious spasms"; they recurred about every two months and gradually became worse. The abdominal pains prevented his taking food and "were terrible round the navel." Head pains were frontal; worse on left side. The pain in the head was of a burning character and would at times extend from the left temple region to the back of the head, sometimes worse, sometimes better, but always worse over the left temporo-frontal region.

Pains in the head and abdomen have gone and he feels a "terrible lot better."

Admits alcoholic indulgence in the past which he excuses on the ground of his chronic illnesses. Promises to abstain. His wife has noted a very definite change in his temperament whilst out on parole; formerly miserable and unable to appreciate any recreational relaxation, he now goes about singing and is of a happier temperament. She has never seen him look so well.

He was sent out on trial on January 1, 1928. At the end of the month his doctor's, the visitor's and his relative's reports were satisfactory.

Discharged recovered, February 1928.

March 1928. Reports equally satisfactory. He had returned to work.

(C) *Mental Symptoms predominant.*

This sub-group includes cases where the two conditions of "closed" chronic sepsis and unstable mental state had been in existence for some time.

Normal influenzal symptoms were not manifest, being in all probability masked by the mental symptoms which formed the predominant part of the clinical picture. Confusion was less in evidence than in the previous case.

One case is quoted to illustrate this class.

CASE VI. Under the care of Dr. J. M. Mackenzie. E. A. B., male, married, lead worker, age 49. Admitted on February 11, 1927. First certification.

State on admission.—MENTAL STATE. In a condition of mania. Exalted, restless, noisy, threatening and abusive, rambling and incoherent in conversation, said he was the richest man in the world and that his relatives were trying to murder him to get his money.

PHYSICAL STATE. Temperature 98°. Pulse 70. Weight 7 st. 7 lbs. Cardiovascular, pulmonary and abdominal viscera appeared normal. Nervous system nil. Mouth, pyorrhœa, many carious teeth and roots. Old scar of cut-throat, self-inflicted, over thyroid cartilage, a septic skin eruption on both forearms and an eczematous condition of scrotum.

Blood: Wassermann test, negative. Widal test: negative except for typhoid 14 Oxford units (Army inoculation).

Clinical Course.—Following dental treatment, colon irrigation and ultra-violet light he became calmer and improved physically; the cutaneous sepsis disappeared and he began to gain weight. The improvement continued and at the beginning of May a review of his state elicited correct orientation; he was composed, had apparently gained insight into his state, admitted the facts of his certificate and that he had been talking nonsense. Work, conduct in and out of the hospital satisfactory. He was went out on trial, obtained employment with his firm. Reports at the end of the month were satisfactory.

Discharged recovered June 10, 1927. Weight 8 st. 9 lbs.

During August 1927 another attack of excitement of a more intense character developed, acute symptoms being manifested for four days before re-certification on August 20, 1927.

State on re-admission.—Physical state showed no special change from that noted on discharge, but weight had fallen to 7 st. 13 lbs. Mentally similar to condition on previous admission, but visual and auditory hallucinations were more marked than on the previous occasion. At night very restless. During the next three weeks the intensity of the symptoms subsided.

On September 2 an intravenous injection of T.A.B. was given.

Towards the middle of September a sudden exacerbation of symptoms occurred, almost dramatic because preceded by the period of improvement. During this period he stated that he was poisoned and that electricity was " put on his head " by the staff. At night noisy, chattering and restless. On one occasion he was found in the lavatory plastering fæces on the walls; when remonstrated with he made a violent attack on the night nurse. Later conduct became less intense. On account of the inequality of the naso-labial folds and the variation of his mental symptoms sinus disease was suspected and on October 13 the ear, nose and throat surgeon found: nose: wet and septic, both sides. Sinuses: antra, both dull, especially right; frontals, right dimmer than left. Naso-pharynx: pus. Tonsils: buried.

He continued restless, hypomaniacal, erratic and mischievous. Allegations of poisoning and electrification continued.

October 26, under general anæsthesia, a general sinus examination with Watson-Williams technique. Sphenoid: R. nil; mucosa appears normal. L. thickened mucosa; no exudate observed. Ethmoids: R. mucopus; L. mucopus. Antra: R. much pus; L. pus.

Bilateral antral intranasal drainage performed.

Following the operation he became calmer and after a week was much better behaved and slept well, except that on November 7 he had a disturbed night. On the following day the antral washouts gave small clots of pus and thereafter he slept well and conduct by day improved.

On November 23, ear, nose and throat review showed post-nasal space clear. Antral washouts, only flakes of mucus.

On December 7, under local anæsthesia, antral openings cauterized to prevent closure.

From December 8 to 14, 1927, six injections of T.A.B. vaccine, the first three intramuscularly, last three intravenously. Temperature of 102° and rigors were noted. Continuous colon irrigations, two to three gallons at each irrigation, brought away much thick mucopus. Later, irrigations, using nine to ten gallons, eventually gave clear returns. Mentally he was now better than on the previous occasion and able to give a detailed and connected account of himself (see History below).

He was sent out on trial on January 12, 1928, and was immediately taken on again at his works. At the end of the trial period his doctor's, the visitor's and relative's reports were satisfactory and he was discharged, February 1928, as recovered.

Abridged History.—No insane relatives.

Standard VII at the age of 12 : entered a leaded-light trade in his 'teens and except for war service has been continuously employed with the same firm since 1913. In infancy, bronchitis, whoopingcough and scarlet fever. Since age of 14 suffered with frontal headaches and "bilious attacks," i.e., indigestion, anorexia, abdominal discomfort, a burning sensation in hypogastrium, belching, at times vomiting and constipation. Headache came first. Attacks cleared up as a rule with a purge. Associated with these attacks at night he sometimes had a curious sensation in the feet and legs but not above the knees. Tickling, then a sensation of cold and then heat so that he had on occasion to get out of bed and stand on a cold surface. No swelling, blanching or reddening of the skin. Later, bilious attacks passed away and only had headaches after alcohol which he began to take at the age of 17. Later he drank beer rather freely. He excuses this on account of insomnia produced by the sensations in the legs. Appears to have had a mild attack of delirium tremens when 25.

After the War he was sent by his firm to South Africa on a contract. Here he indulged in wines and spirits with the result that he developed a depressed persecutory state and cut his throat to escape from his supposed tormentors. Returning to England was again taken on by his old firm and had no further breakdowns until his first certification. It was six weeks after his first discharge from mental hospital that he had his first drink to induce sleep.

A fortnight before second admission he had had three glasses at night ; on the following morning he had a sudden flushing of the head, a hot uncomfortable sensation all over the head, not worse in any one place, and he understands his face went purple. The flushing lasted about three hours and gradually passed off. No visual or auditory hallucinations were associated. Four days before second admission he again felt "uncomfortable in the head," a feeling of "depression or pressure" developed, more on the right side, not the flushed sensation, and all the time it seemed as if he could hear "voices" speaking, more pronounced on the right side. His wife states he suffered with headaches and would sit with his head in his hands ; she gathered the headache was worse on the right side. He states that tobacco gave him a headache more on the right side, and for the last fifteen months had abstained from tobacco. Does not remember a definite attack of influenza. Has not had neuralgia but has had bad toothaches and has pulled out several teeth himself in the past.

Explains some of his sensations, e.g., the "electricity" allegations were based on a feeling in his head as if he had two terminals or plates, one on either side of his head. This sensation and the "voices" disappeared after the nasal operation ; they were

present before but have not returned since. The antral irrigations following operation have not caused any sensation akin to the "flushing" sensation, etc. The last T.A.B. injections caused a temporary frontal and occipital headache. His head feels clear now. The leg sensation has not been so pronounced and he sleeps better.

As in Case II it may be objected that there is no definite evidence of a history of influenza and it may be urged that alcohol was the real precipitating factor.

The writer is not prepared to deny that alcohol may have played a part in the causation but points out that alcohol had been possible as a precipitating factor (and had formerly when used excessively been so) for a considerable time before the development of certifiable mental symptoms, which did occur actually during the incidence of the influenzal epidemic.

As in Case II, so in this case, it is considered that the influenza infection acted on an individual rendered unstable by long continued chronic closed septic infection in the skull, and so produced definite mental disorder, but left that disease process in a more advanced state than before the onset of the infection. The periodicity characteristic of sinus disease now came into play with reduction of vitality, leading to desire for alcohol; this intensified the pathological process by causing a congestion reaction and the production of certifiable mental symptoms.

The pathological process in the skull was now becoming dominant as shown by the persistence of the abnormal conduct reactions induced by the local toxic condition and irritative factors.

With the cleansing and draining of the sinuses followed by non-specific protein therapy the patient stabilized with a better mental capacity than on the preceding discharge.

The development of the sinus disease in slow and insidious form probably dates back many years to a dental and/or possibly influenzal causation.

Delayed Group.

In this group are cases in which there is no immediate relation between the subsidence of the influenzal symptoms and the development of the manifestations of acute mental disorder. During the interval the individual may be indefinitely ill, due to the incomplete resolution of a low grade sinusitis consequent upon the influenzal infection, or there may be intermittent periods of apparent good health. Later, as a result of some exacerbating agency, the sinusitis again becomes dominant. The symptoms are usually, first insomnia and headache, and later the development of an abnormal mental state.

An example of the first category is the following history given by a husband concerning his wife, who was admitted in a state of confusion: "She had influenza, did not go to bed and has not been the same since. The first thing she could not sleep, became 'low' and then developed depression." In this case antral sinusitis was subsequently proved to be present.

An example of the second category, where periods of good health may be shown between the influenzal attack and the onset of definite mental symptoms, is a case reported by Patrick Watson-Williams.[9]

M., age 29 (neurasthenia, nasal catarrh).

1901, severe influenza. 1903, appendicitis. 1907, appendicectomy. 1908, prolonged insomnia, depression. Went voyage. 1908–1911, health normal.

1911, February, ? influenza slight. Headaches, insomnia, depression. Consulted four physicians. Went voyage. Suicidal, incapable of any mental effort, yet played golf well and looked strong. August, chronic pan-sinusitis. Delusional insanity. Operations on sinuses. Culture showed pure staphylococcus aureus. Cured. Mental recovery complete.

1927. December. Good health for sixteen years.

In this case of occult nasal sepsis an abdominal operation became necessary. Early mental symptoms developed but passed away, to be followed much later, after the exacerbating influence of a slight attack of influenza, by definite mental symptoms of a more severe character. In such cases mental disorder succeeding an operation is usually attributed to the abdominal condition or to the operation, rather than to the primary cause of both conditions, viz., the septic disease in the skull.

A case illustrating the period of illhealth between the attack of influenza and the onset of certifiable mental symptoms is the following.

Case VII. Under the care of Dr. Kathleen A. H. Sykes. E. M. K., single, domestic, age 45.

Admitted September 14, 1927.

Previous History.—Family: no psychotic history.

Clinical History.—Suffered with headaches for many years. Influenza early in 1927; did not effectually recover; became depressed. During August 1927 condition became worse and finally she was certified.

State on admission.—Menstruation had been in abeyance for three months before admission when she was found to be depressed, agitated, showing considerable fear manifestations, restless and confused. Cutaneous, oral, nasal, bowel and gynæcological sepsis. Wassermann and Widal tests negative. Treatment of oral, bowel and gynæcological sepsis, together with a course of non-specific protein therapy, resulted in some improvement. Hypertrophied and purulent tonsils were dissected and ethmoidal infection treated.

After this the facial colour and sepsis improved considerably. Menstruation returned and was regular. Marked mental and physical improvement succeeded.

Discharged recovered, after a satisfactory month's trial during which the improvement continued, in March 1928. Her doctor's, the visitor's and relative's reports were satisfactory.

In this case (patient's age 45), the onset of acute symptoms was associated with an amenorrhœa which together with the mental state might be attributed to the onset of the climacteric, yet with the removal of septic conditions the function returned and the mental state improved.

Another case illustrates the culmination of recurrent sore throats and "colds" in the production of a mental state.

Case VIII. Under the care of Dr. Kathleen A. H. Sykes. E. V. M. W., female, single, clerk, age 26. Admitted August 28, 1926.

Previous History.—Family: not psychotic. Mother has chronic otitis media. Personal: Recurrent sore throats and "colds" since 1921. Later catamenia tended to irregularity. During spring and summer (hay season) of 1926 continued with her colds and gradually developed psychotic symptoms beginning with enviromental maladjustment. Could not tolerate the pleasantries of those around her. Symptoms became worse. Confusion developed and became intensified during the premenstrual phase of the menstruation present on admission.

State on admission.—Acute auditory and visual hallucinatory confusion, agitation, restlessness, destructive, wet and dirty, resistive to nursing. Pale, losing weight, dilated rapid heart, poor peripheral circulation. Streptococcal glossitis, tonsils enlarged, septic, containing pus; pharynx congested with mucopus, bilateral rhinitis, uterine cervicitis with mucopurulent discharge. Wassermann and Widal (all groups) negative.

Clinical Course.—The cessation of menstruation occasioned little if any improvement. Catamenia missed in September but appeared in October and thereafter ceased. A course of intravenous T.A.B. resulted in some amelioration of symptoms. Her agglutination capacity was poor, giving only a maximum of 10 Oxford units to para. A., and no agglutinin to typhoid or para. B.

Gynæcological and dental treatment. At the end of October the tonsils were removed by dissection; both were fibrotic and showed evidence of old inflammatory changes. Her weight, which had previously fallen, now began to rise and she became gradually better mentally. A second course of T.A.B. was given and weight still rose so that at the end of December she was heavier than on admission. Catamenia were still in abeyance although aloes and iron were given together with actinotherapy.

In January she began to improve definitely but was still apathetic and easily depressed. Menstruation occurred in March and thereafter a definite mental and physical change was noted. The function continued regular thereafter.

Discharged recovered after a month's trial, June 1927. Her doctor's, the visitor's and relative's reports were satisfactory. Weight on admission, 9 st. 8½ lbs; on discharge, 11 st. 13 lbs. Widal in March 1927, negative to all groups.

Her doctor reports in June 1928: She is mentally and physically in excellent health, has not had to consult him for any ailment since discharge and she has returned to and is working satisfactorily at her former place of employment.

CONCLUSIONS.

(1) In persons without psychotic inheritance but with pre-existing septic diseased states in the head (which may date from childhood and may be responsible for some predisposition to mental disorder) an attack of influenza, by causing an acute exacerbation of the pre-existing pathological process, may precipitate serious mental disturbance even although constitutional symptoms of influenza may be slight or absent.

(2) The pre-existing pathological processes may be responsible, directly or indirectly, for pathological changes elsewhere in the body, and from these collectively further general toxæmia may ensue; when these secondary processes have subsided the original focus in the head does not necessarily return to the status obtaining before the acute exacerbation and some of the mental symptoms displayed during the acme of the acute process may persist.

(3) The mental symptoms and the corresponding pathological conditions of septic foci with deficient or defective drainage may continue indefinitely, being subject to periods of exacerbation and quiescence.

(4) The usual influenzal symptoms displayed by a normal or otherwise relatively healthy person may show considerable differences from those occurring in persons with an existing chronic septic process in the head.

(5) Within the skull, therefore, pathological processes may exist, the extent of which may determine the degree of mental symptoms displayed.

I desire to acknowledge my indebtedness to my colleagues of the visiting staff of the hospital for their observations on and treatment of the cases described in this paper, viz., Mr. W. Stirk Adams, ear, nose and throat surgeon; Mr. A. B. Danby, gynæcological surgeon; Mr. T. Yoxall, dental surgeon; and also to Dr. F. A. Pickworth, Director of the Research Laboratory for Mental Disease of the City and University of Birmingham. I am also indebted to my colleagues of the resident medical staff of the hospital from whose notes the description of the cases has been compiled.

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MAJOR HYSTERIA WITH ATTACKS OF IMPAIRED CIRCULATION OF THE LEFT UPPER LIMB.*

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THE case reported in this paper is of importance because of attacks of grave hysteria occurring after severe head trauma and associated with attacks of disturbed circulation of the left upper limb. It leads to a consideration of some of the peculiar clinical conditions attributed to the thalamic and striate regions. The extraordinary periodic alteration of the circulation of the left upper limb in this patient is an unusual phenomenon and probably was partly under the control of the will.

The patient, male, 19 years of age, was referred to me by Dr. A. C. Trapoid, of Wilkes-Barre, April 28, 1927.

CLINICAL HISTORY.

In February, 1926, the boy was struck from behind by some unknown assailant while returning from his daily work as a stenographer. He laid unconscious in the snow for a period of two hours before regaining consciousness. He was then taken home in an automobile, but was able to walk and complained only of a slight headache. He ate supper and retired. The next morning he complained of a severe frontal headache, felt dizzy, fell over unconscious and awoke in bed about an hour later. He was sent to the hospital complaining of severe headache in the top of the head. This gradually disappeared and he was well at the end of ten days except for numbness and swelling of the left upper limb. He could raise the upper limbs in all directions, but he tired easily. The numbness disappeared at the end of six weeks.

Following this period he was well until June 1926, when he was struck on the head by a falling baseball. He was temporarily stunned but did not lose consciousness. The next day while at work he had what he termed a "weak spell," which lasted about one half hour. In this attack he fell over unconscious, but did not have convulsive seizures. He complained of severe headache (apical and frontal) for two days. After this he was in good health until April 16 1927, except that since his original injury he had frequent swelling of his left upper limb; the limb turned a purplish colour and was cold from the elbow down. He seems to have had no such attacks before his injury.

On April 16, 1927, he arose as usual, felt perfectly well, but while eating breakfast complained of severe frontal headache, later becoming occipital. In attempting to pick up his lunch basket from the table it fell to the floor and

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on stooping over he walked several feet and fell forward on the floor. He was unconscious for several hours but had no convulsive seizures, until he was apparently regaining consciousness, when twitchings of the muscles were noticed over the entire body. Following this he had similar convulsive seizures at short intervals in which his head and body assumed a position of opisthotonos. He had no further seizures from 8 p.m. until 9 a.m. the following morning, when similar attacks occurred at very short intervals; in these his arms and legs were extended, accompanied by slight jerking and marked retraction of the head. His father states that during an attack the left arm and forearm became markedly reddened and swollen, and the veins of the forearm stood out very prominently. Upon recovering from this seizure he complained of severe frontal headache, changing to occipital. During the attacks he never frothed at the mouth or bit his tongue, and he had no incontinence of urine or faeces.

Description of Attacks.

Note of observation by myself, May 23, 1927.—He has been having attacks about every five minutes. The attack begins with simultaneous fine tremor of the fingers of both hands, tremor of the eyelids of each side, followed almost immediately by great spasticity of all four limbs. The fingers of each hand are over-extended; the feet are contracted into the position of talipes equinovarus. The body is arched in opisthotonos, and towards the end of the attack there may be one severe jerking of the trunk upward in more pronounced opisthotonos and the attack is over. The entire attack lasts scarcely more than one minute. Towards the end of the attack there is jerking of the muscles about the mouth and in the cheeks. In the intervals between the attacks the muscles are very relaxed and the man is slightly cyanosed. His pulse is rapid and his blood pressure is 165/80. The attack frequently ends with a violent contraction in opisthotonos, followed by sudden relaxation, so

Photograph taken during a convulsive attack. It shows the opisthotonos, the overextension of the fingers, and the position of the upper limb most favourable for the circulatory arrest. (From a moving picture film made by Dr. A. M. Ornstein.)

that the body falls heavily on the bed. He has repeatedly come out of the attacks suddenly with complete consciousness, and then suddenly with a severe extension movement of his upper limbs has returned into an attack. The moderate cyanosis after an attack seems to be particularly marked in the distal parts of all four limbs; the distal parts of the lower limbs are moist and cold. This is different from the cyanosis of the left upper limb alone. Dr. Loe, my interne, observed that the pupils were dilated markedly and seemed to react very slightly to light. The attack is typically one of major hysteria.

We attempted to bring on a vasomotor discoloration of his left upper limb by suggestion, placing a hypodermic needle under the skin of the left arm, but it had no effect even with repeated suggestion. Pressure was made behind and below the tip of the right mastoid process. This spot is a hysterogenic zone and corresponds to the place where the man received the blow. Pressure immediately produced an attack exactly like those previously described, but the opisthotonos was more pronounced, and was so extreme that the top of the head rested on the bed. The arching of the body once or twice assumed a forward type which was never very pronounced, but the lower limbs were forcibly flexed at the hips to a considerable degree and then suddenly allowed to fall.

The patient said that he was told on May 21 that as he had had no attacks since he came to hospital he might as well go home. He was overjoyed by this and was thinking very much about returning to his home. Two days later he began to have the convulsive attacks described above. They have been very frequent and are all of the same type.

The eyes were examined and reported negative. The blood Wassermann was negative in all antigens. The head was reported negative by X-ray examination, and X-ray examination for cervical rib showed no evidence of this anomaly.

Results of examinations made by my interne, Dr. J. W. Clark, July 5, 1927, on the condition of the blood pressure and of the pulse of the upper limbs during an attack of congestion of the left upper limb, testing the limbs alternately and quickly, are as follows:

Blood Pressure.

Right Upper Limb	Left Upper Limb
130/86	90/54
132/90	90/54
132/96	80/45
131/95	128/78
130/100	124/85
130/75-Later	122/85

Pulse.

86.	86.

FURTHER CLINICAL OBSERVATIONS.

On May 30, 1927, I had the opportunity of seeing one of the attacks of cyanosis of the left upper limb. The discoloration was very intense. The whole left upper limb was a reddish purple which shaded off into the normal appearance near the axilla. The man believes, and his belief seems to be well-founded, that the attack is more likely to develop when he is lying on his right side and his left upper limb is fully extended. The attack this morning seemed to be distinctly influenced by this position and has lasted during the entire time in which this position was maintained, but this is the position of the upper limbs during the convulsion. Blood pressure observations made during periods of relaxation and unconsciousness revealed the following :—

Left upper limb blood pressure 156/80 ;
Right upper limb blood pressure 134/62.

The blood pressure was less in the left upper limb during an attack but greater in the period of relaxation following.

The patient assumed the position necessary to induce an attack of cyanosis and swelling in the left upper limb. The required position is as follows : he lies upon his right side and allows his left upper limb to be extended either along his body or a little behind his trunk. From near the elbow the limb became a deep reddish blue colour. The depth of colour increased towards the fingers. The left hand and forearm appeared to be swollen ; the skin was tense. The biceps muscle was apparently in unusual tension. The veins of the hand, forearm and upper arm were distended with blood ; those of the forearm stood out prominently.

In one unusually severe attack the following observations were made. Right radial pulse 88 ; Dr. J. W. Clark thought that he obtained the left radial pulse once and counted it to be 88. However, upon further repeated observations he was unable to detect the pulse at the radial artery or in the brachial artery at and above the elbow in the left upper limb. Blood pressure right upper limb 126/82. In the left upper limb no sounds were audible upon repeated attempts. The observer caused the mercury to rise to at least 180 mm. and listened carefully down to 30 mm. When the left upper limb was elevated and the attack was passing off, he noted that the left hand and fingers felt quite cold and clammy. The temperature of the forearm and arm seemed to be normal. There was no apparent abnormality in the right upper limb. In the upper arm, as the normal colour returned, there remained numerous little punctate areas of discoloration, as though the areas around the hair follicles were the last to lose it. About twenty minutes after the attack the following observations were made. Blood pressure, right upper limb, 126/84 ; left upper limb, 112/70. The auscultatory sounds incident to the reading of the blood pressure in the left upper limb were at the time of the reading 112/70 relatively faint. Those in the right upper limb were loud. When the blood pressure was taken in the left upper limb ten minutes later it was 126/80. The

auscultatory sounds in both arms were then equal. Radial pulse, right upper limb, was 72; left upper limb, 72. The two pulses were synchronous. Dr. Clark reported that at first practically none of the attacks of unconsciousness were accompanied by discoloration of the left upper limb, whereas during the past two or three weeks about 75 per cent. of the attacks of unconsciousness were accompanied by a variable discoloration of it.

August 3, 1927. The patient says the cyanosis of the left upper limb is produced when he puts "stress into it," as in eating or typewriting; he does not seem to have it unless he increases the tonicity of the muscles of the limb. He has it in typewriting when he strikes the keys hard in making several carbon copies. The cyanosis suggests a mechanical origin, as though caused by contraction of muscles of the upper arm interfering with the circulation. He has no power of doing this in his right upper limb.

DISCUSSION.

Rudolf Schindler[1], in a recent monographic study of the relation of the nervous system to spontaneous hæmorrhage, concludes that small cutaneous ecchmyoses are very frequent in hysteria and in some cases these ecchymoses may be enormous. The condition is curable by psychotherapy. If ecchymoses may occur as a part of hysteria, as we now understand this disorder, cyanosis would seem to be possible also as a result of hysteria, and then the question arises whether both hysteria and ecchymoses or cyanosis may not be the result of thalamic, subthalamic or substriate lesions. We failed entirely to produce the cyanosis of the left upper limb by suggestion.

Kinnier Wilson[2] has mentioned the resemblance of grave hysterical convulsion (*arc de cercle*) to certain symptoms produced by mesencephalic transection.

In my paper[3] on subcortical epilepsy I referred to the possibility that the striate body may be an important part of the sympathetic supply, and may contain vasomotor centres. It is possible that certain manifestations of epidemic encephalitis which have been regarded by some as suggestive of hysteria may be related to the thalamic or subthalamic region, and vasomotor disturbances occur in epidemic encephalitis which affects this part.

Cases such as those reported by Sokolansky[4] are very difficult to interpret. One patient, for example, had definitely had epidemic encephalitis followed by Parkinsonism. He had frequent attacks of the following character: he complained in an attack of pain about the heart, of a feeling of great anxiety; he longed to die and begged for poison. This emotional disturbance ushered in an attack. Tonic spasms of the eyes then caused the eyeballs to be drawn upward—a condition frequently observed in epidemic encephalitis. These attacks were followed by severe myoclonia of the whole body. Saliva flowed, perspiration was free, and the pulse was between 110 and 120 per minute. The patient under ordinary conditions did not have the power to raise himself in bed, but in the attack he sprang from the bed with extraordinary speed and

ran along the corridor, but would fall. He attempted to bite or spit upon anyone who came near him. During the attack consciousness was preserved, his behaviour was impulsive or emotional, he acted contrary to his will, he said he was controlled by some evil force. He begged to be fastened to the bed as the attack was coming on, and during it warned all to keep away from him. The emotional element in these attacks suggests the optic thalamus. The attacks were thought possibly to be the result of some biochemical process affecting the basal ganglia.

Foerster[5] states that the optic thalamus is under the control of an inhibitory tract from the cortex and also of one from the corpus striatum. When these tracts are destroyed in lesions of the thalamus a very limited irritation of some part of the body may cause an over-reaction referred to the entire half of the body on the side of the lesion (hyperpathia); in some instances it may be referred to the entire body. These phenomena are seen in highly neurotic individuals. In this way also the over-reaction from stimulation of special senses in thalamus lesions, so that this stimulation produces pain, is explained, for all sensations and special senses depend on the integrity of the optic thalamus.

Accepting these statements made by Foerster we may assume that in a case such as that reported by Sokolansky the emotional disturbances were caused by lesions of the optic thalamus resulting from epidemic encephalitis.

Shall we conclude that the convulsive attacks in my patient were the result of the severe head trauma and dependent on such a lesion (possibly hæmorrhagic), as that producing mesencephalic transection, and that the cyanosis of the left upper limb was caused by striate lesions, or shall we seek further for an explanation? The convulsive attacks were undoubtedly influenced by suggestion.

That hysteria may be associated with epidemic encephalitis is shown by Marinesco[6], as he was able to remove the hysterical element by psychotherapy. He says his observations demonstrate that epidemic encephalitis favours the appearance of hysteria because a relation exists between the mechanism of these two pathological states, and that recently Binswanger reported a case of traumatic hysteria with the appearance of postencephalitic Parkinsonism. Marinesco reports a case of epidemic encephalitis with Parkinsonism, also with hysterical hemiplegia and hemianæsthesia and other hysterical signs, cured by suggestive and electrical treatment under the form of torpillage, but the encephalitic manifestations persisted.

There is an explanation for the cyanotic attacks in the left upper limb of my patient which demands attention. Dr. J. B. Wolffe has referred me to a paper by Hyman[7] on voluntary pulse control in the radial artery at the wrist. Hyman has seen three patients in 1926 who had the ability to regulate or stop their pulse at will. He could find nothing on the subject in the literature as late as 1926. It was known to physicians during the world war that certain soldiers attempting to malinger could alter the activity of their radial pulse

by contracting the adductor muscles of the shoulder joint when a rolled towel or similar object was placed in the axilla, and in this way make pressure on the axillary artery.

Deliberate interference with the pulsations in the axillary artery has been noted in certain individuals with 'loose joints'; in such persons extreme rotation of the humerus winds the artery round the bone, with subsequent compression of the vessel.

A more subtle mechanism is that wherein the pulsations in the radial artery are controlled by voluntary muscle contraction either consciously or unconsciously on the part of certain persons who possess unusual neuromuscular reflexes. Hyman examined a man who could "will" his radial pulse to become smaller, and if he "willed it hard enough" he could stop the left radial pulse for about fifteen seconds without appreciable effort. The heart rhythm and the pulsation of the right radial artery were not affected. The "block" was located by Hyman in the left subclavian artery where the artery passes over the first rib and under the insertion of the scalenus anticus muscle. Examination under the fluoroscope showed a small movement of the soft tissues lying under the outer end of the clavicle. The patient was not aware of muscle movement but he experienced muscle fatigue in the deep neck muscles of the posterior group.

Two explanations are regarded as possible: the first, that the subclavian artery perforates the scalenus anticus muscle and because of its peculiar development this muscle exerts a sphincter-like action when contracted, shutting off the pulse wave in the artery. The second possibility is that the left subclavian artery has an unusually well marked isthmus which is readily constricted when the scalenus anticus muscle in contracting presses it against the tubercle of the first rib. The longest period Hyman's patient could "block" the radial pulse was 18·6 seconds.

Since this paper was read an interesting study on the diagnosis between hysteria and extrapyramidal disease has been published by Rothfeld[8], with references to the literature.

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LEBER'S OPTIC ATROPHY AND ITS RELATIONSHIP WITH THE HEREDO-FAMILIAL ATAXIAS.*

By FERGUS R. FERGUSON and MACDONALD CRITCHLEY, London.

INTRODUCTION.

The purpose of this paper is to draw attention to the existence of an atypical variety of Leber's disease, wherein positive neurological signs were present in addition to the optic atrophy.

Since the publication of Leber's original paper[1] in 1871, we have been accustomed to regard the form of optic atrophy which bears his name as a pure clinical entity uncomplicated by other morbid conditions in the nervous or other systems. We have regarded this disease, moreover, as one which breeds true; that is to say, there is no variation in the clinical features as appearing in successive generations. Furthermore, no characteristic mental or physical anomaly is known to occur among members of the family who themselves show no optic atrophy. The monographs of Habershon[2], Nettleship[3], Favier[4] and others who have carefully reviewed the literature, on the whole confirm this view.

The clinical picture of Leber's disease is fairly well-defined. It comprises a heredo-familial type of optic atrophy in which both males and females are affected, but is transmitted through the females alone. Symptoms commence at puberty or shortly afterwards, often with a rapid onset; one eye may be affected before the other. Vision deteriorates, but complete blindness is exceptional. There is a central scotoma with little or no peripheral constriction of the visual fields. The disc changes in the earliest stages are those of a neuritis, but the later appearances are those of a definite optic atrophy. There may be a slight degree of improvement in the state of vision, after which the condition remains stationary. No obvious etiological factor can be traced and physical examination reveals no abnormality in any region outside the optic nerve.

Although the symptomatology of Leber's disease is comparatively clear-cut, opinions are divided on the question of pathogenesis. We may briefly mention the hypotheses of an inherited temporary disorder of the pituitary gland; of meningeal inflammation round the optic foramina; of toxic retrobulbar neuritis due to some neighbouring sepsis and affecting tissue which bears an inherent vulnerability. Lastly, there is the conception of a primary neuronic degeneration localised to the optic nerve.

Leber quite definitely excluded from his cases all instances of optic atrophy associated with nervous disorders. But, in the family about to be described, one member showed the additional features of epilepsy and mental defect, while another showed signs of a marked neurological affection, sufficiently

* Carried out under the auspices of the Medical Research Council.

severe to cause her to seek advice at a nerve hospital. Despite these added unorthodox features there is no doubt whatever that the familial affection is one of Leber's disease.

THE N. FAMILY OF KILBURN.

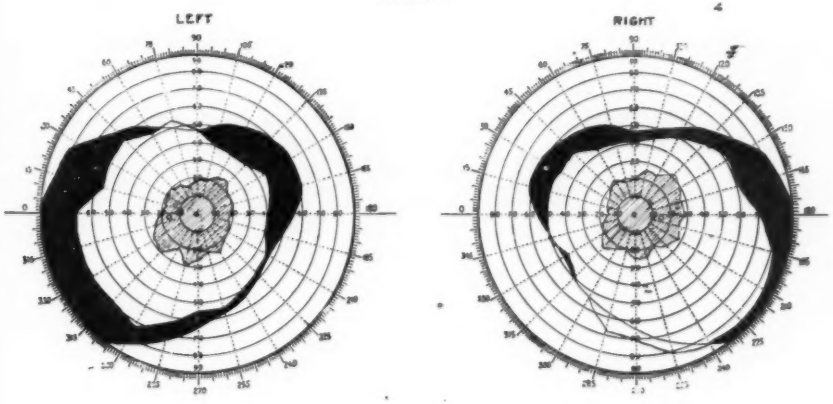
The four cases recorded in this paper are those of the surviving offspring of Mrs. Ada N. (née D.). One son died about the age of six months from "curvature of the spine and convulsions." There were no miscarriages. Mrs. Ada N. herself is one of a family of seven (two sisters and four brothers). They were all of normal mentality and average intelligence. We have not been able to obtain any information which would lead us to suspect that any of them suffered from defective sight or any nervous disease (See genealogical table.)

Mrs. N.'s husband and his parents did not show any ocular or neurological abnormality. Mr. and Mrs. N. were not related prior to marriage.

CASE 1. Minnie N., age 30.

History: Symptoms commenced at the age of fourteen with gradual impairment of vision in both eyes. In the course of the next few months the sight grew worse, but it has remained approximately the same ever since. Nine months after the onset of the visual defect she was admitted to the Maida Vale Hospital under the late Dr. Guthrie.

CHART I.



Examination at that time showed a slight swelling of both discs passing into atrophy, with bilateral central scotomata. There is no record of any other abnormality in the central nervous system and the diagnosis of familial optic atrophy was made. While she was an in-patient her vision somewhat deteriorated.

Apart from her visual defect she is perfectly well and works as a housemaid.

Physical examination, August 8, 1928.—Normal appearance and speech; no psychical defect.

Visual acuity 1/60 in both eyes. The fields of vision show large bilateral central scotomata with slight peripheral constriction (see chart I.). There is no field for red or

green. The optic discs are atrophic and of bluish-white colour, especially on the temporal sides; the edges are sharp and the laminæ cribrosæ are not visible. The fundi are otherwise normal.

Pupils: Left slightly larger than right, react normally. Ocular movements full; no nystagmus.

The other cranial nerves are normal.

No abnormality was demonstrated in complete examination of the rest of the body.

CASE 2. Charles James N., age 27.

Is at present an in-patient in Caterham Mental Hospital, Surrey, and we are much indebted to Dr. Leslie Gordon and Dr. Turnbull for permission to examine the patient and for details of his history.

History: A normal child at birth, he talked at 12 months and walked at 18 months; teething normal. During early life he appeared to be a perfectly normal boy and went to school at the age of five; while at school he was given glasses because he could not see very well. At the age of 12 his eyesight failed very rapidly; he became abnormal mentally and ceased to learn. In consequence, he was taken from school and "put to work." He is said to have fallen in with bad companions and was unable to keep in employment for any length of time.

About this time, his sister Minnie was an in-patient at the Maida Vale Hospital; Charles—in common with the other members of the family—was examined and reported to have optic atrophy secondary to optic neuritis. There is also a note to say that he "carried himself stiffly."

Because of his inability to keep in employment, he was medically examined and sent to Darenth colony in August, 1919.

At that time he is described as having been backward and ignorant (able to count to 100, but unable to name the King of England). His pupils were dilated and sluggish, his fundi myopic and the general appearance suggested blindness. In 1920 he had an epileptic fit. In March, 1921, he was transferred to Caterham Mental Hospital and was classed as an imbecile with epilepsy. Glasses were ordered for him but they did not improve his visual acuity. In 1924 he had several syncopal attacks and valvular disease of the heart was diagnosed.

The Hospital records state that he has very occasional fits (none for fifteen months), that he works well, quietly and willingly and that his general conduct is excellent.

The patient himself says that he could see fairly well until he was twelve or thirteen; about that time his vision became rapidly worse, but since then it has remained the same.

Physical examination, August 18, 1928: Well developed and well proportioned young man, staring vacant appearance, prominent eyes, marked overaction of the frontales muscles; the head is tilted over towards the right shoulder. Speech—lalling, childish and slightly dysarthric. Co-operation good.

Counts fingers at 2 metres with the right eye and at 1 metre with the left eye. Both eyes, especially the left, show a high degree of myopia. The right optic disc is greyish white all over, but it is definitely paler on the temporal aspect. There is some accumulation of pigment round the disc, the edges of which appear clear-cut. The lamina cribrosa is not visible. The blood vessels are not reduced in calibre and the macular region is normal. The left optic disc is "paper white" all over, its edges are rather indistinct in outline and there is no pigmentary disturbance round it. The blood vessels are not reduced in calibre and the macula is normal.

The patient co-operated remarkably well in testing the fields of vision and showed a definite central scotoma for a white object in both eyes, together with some constriction

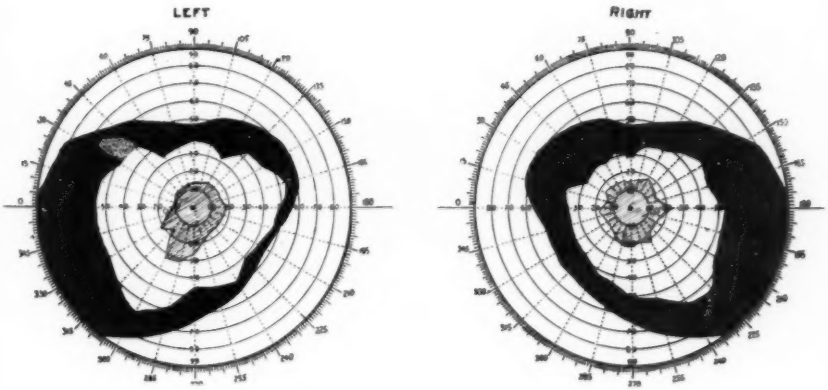
of the peripheral fields (see chart II.). Examination of colour vision revealed central scotomata for red, green and blue, with a narrow field for each colour round the scotoma. The red field was larger than the green and the green larger than the blue. In the upper and outer portions of the field, vision for blue was almost absent.

The pupils were moderately dilated, equal, circular, central and reacted to light normally. Convergence and reaction on accommodation good. No nystagmus.

There was bilateral exophthalmos and marked overaction of the frontales muscles, but otherwise the cranial nerves were normal. No abnormality was detected in the muscular or sensory systems. The reflexes and gait were normal. No trophic changes or stigmata of degeneration were present and the testes were descended. The pulmonary, cardio-vascular, alimentary and genito-urinary systems showed no abnormality.

X-ray of skull, relative opacity of the sphenoidal sinus, otherwise normal. The cerebro-spinal fluid was clear and colourless; cells, 0 per cm.; total protein, 0·04 per cent.; globulin, weakly positive; Lange, no change. Wassermann reaction, negative in the cerebro-spinal fluid and blood.

CHART II.



CASE 3. Nellie N., age 25.

History: She was normal in every respect until the age of eleven years. During the course of the routine eye examination at school, it was found that she could only read the "big letters on the card." When tested three months previously she had read the letters perfectly well. The patient herself had not noticed the visual defect and had no other symptoms. On the school doctor's advice she attended regularly at the Western Ophthalmic Hospital, where the diagnosis of Leber's atrophy was made.

The vision, however, deteriorated until five years ago, since when it has remained stationary. In other respects she is well and is in regular employment as a housemaid.

Physical examination, August 12, 1928: Healthy looking girl of normal appearance. Psychologically normal. No defect in speech or articulation. Visual acuity, right 1/18; left 1/60. Both optic discs are pale with clear cut edges; fundi otherwise normal. Fields

of vision: right, cæcal scotoma for white and colours with slight peripheral constriction; in left eye there is a large central scotoma for white and colours, with some peripheral constriction (see chart III.).

Pupils and ocular movements normal; no nystagmus. No abnormality in the other cranial nerves.

Examination of the rest of the central nervous system is completely negative.

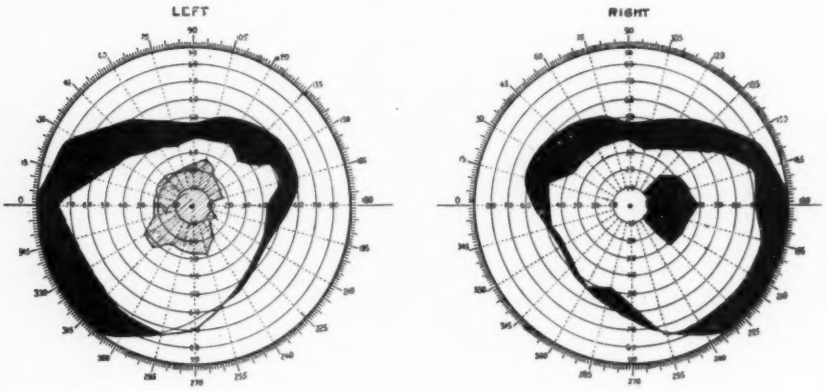
No trophic changes; no stigmata of degeneration.

The cardio-vascular, pulmonary, alimentary and renal-reproductive systems are normal.

CASE 4. Florence N., age 17.

Was admitted to the National Hospital, Queen Square, in June, 1928, under the care of Dr. Grainger Stewart. She complained of pains in the legs and unsteadiness in walking, which had come on six months previously, and of defective vision of five years' duration.

CHART III.



History of present illness: She felt perfectly well except for defective sight until December, 1927. During the Christmas vacation she noticed an aching in both legs; this persisted on and off until March, 1928, when the legs began to tremble. She found that she could not walk properly and that she was reeling about. The legs felt very tired from the feet up to the hips; they were "full of pins and needles" and almost too heavy to move.

In April, 1928, she attended the out-patient department of the National Hospital and saw Dr. Purdon Martin. There has been no headache and no abnormality of the bowels or micturition.

Previous history: At the age of seven she had a corneal ulceration of the right eye and attended hospital for about a year; as a result, the eyes became perfectly normal again.

In 1923, at the age of twelve, her sight suddenly became worse—both eyes were very misty, but she complained of no pain. She was examined by Sir William Lister, who considered her case to be one of Leber's atrophy. Her vision at that time was 2/60 in both eyes and ophthalmoscopic examination showed marked papillitis in the right eye and in the left eye optic atrophy with slight swelling. Sir William tells us that four years previously Florence had been examined and her visual acuity was then 6/6 in both eyes, with correction.

In 1923, Dr. Gordon Holmes examined her and could find no evidence of other disease of the nervous system. An X-ray of the sella turcica showed no abnormality.

Her vision has remained practically stationary since 1923 and has not altered during her recent illness.

From the age of 14 to 16 she was at a residential school in Norwood. About a year ago she went to a school belonging to the London Association for the Blind and worked there until her admission to the National Hospital.

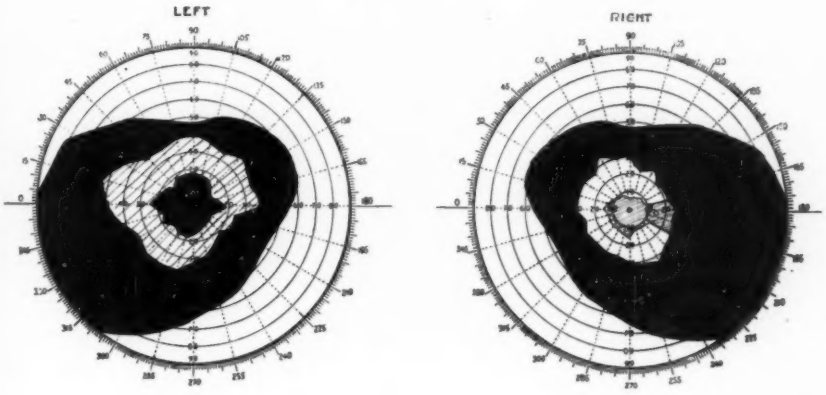
Physical examination, August, 1928: Pale-faced, well-nourished girl; speech a little hesitant, otherwise normal.

Psychologically normal, intelligence fair.

Visual acuity 1/36 right eye; perceives movement of fingers at 1 metre left eye.

The right optic disc is small and white with clear-cut edges; the vessels are diminished in calibre. The left disc is also white with clear-cut margins; laminæ cribrosæ not visible in either eye. Both retinæ have a "peppery" appearance, probably due to the fact that the girl is a blonde.

CHART IV.



The right field of vision shows a definite peripheral constriction with a centro-cæcal scotoma and there is a well-marked central scotoma with peripheral field constriction in the left eye (see chart IV.). In the right eye there is a central scotoma for red with a small colour field round it, otherwise there is no field in either eye for red, green or blue.

The pupils are small but equal and react to light and accommodation through a small range. Ocular movements are full except that convergence is poor. Fairly coarse horizontal nystagmus is present, more marked on looking to the right.

The other cranial nerves show no abnormality.

The upper extremities are normal in power and tone. A slight jerkiness is observed in performing the finger-finger and finger-nose tests, but there is no intention-tremor or dysmetria. The tendon reflexes are brisker than normal, but equal. Power in the legs is fairly good and equal; tone is normal and there is no wasting. A similar jerkiness to that observed in the arms is seen in the legs in performing co-ordination tests. The knee and ankle jerks are brisk and equal. The abdominal reflexes are sluggish but present in all quadrants. Both plantar responses are extensor.

Sensory examination reveals a marked diminution in the sense of passive movement and position and in vibration sense appreciation in both lower extremities, but is otherwise normal. She walks slowly on a broad base with a general unsteadiness and a tendency to sway from one side to the other. Rombergism is well-marked. Slight titubation is present and all her movements are characterised by a jerky action such as one sees in marionette figures.

There is no tenderness, rigidity or deformity of the spine. Both feet show some degree of pes cavus, and the hands are fine, with tapering fingers.

No stigmata of degeneration are present.

X-ray: Stereoscopic views of the skull show no abnormality.

Cerebrospinal fluid: Clear, colourless; cells, 15 per c.mm. (15 per cent. mononuclear); total protein 0·06 per cent., globulin positive; Lange colloidal gold curve 2113321000; Kahn test negative. Wassermann reaction, negative in the cerebrospinal fluid and blood.

The blood sugar curve was as follows:

Resting	0·088 per cent.
½ hour after ingestion of 50 gms. glucose ..	0·157 „ „
1 „ „ „ ..	0·195 „ „
1½ „ „ „ ..	0·141 „ „
2 „ „ „ ..	0·146 „ „

Her condition and signs have varied somewhat during her stay in hospital, but the condition at present (August) is practically the same as in June.

DISCUSSION.

We have no doubt that the family described is one of Leber's optic atrophy. The familial incidence, the onset at puberty, the presence of optic neuritis leading to atrophy, the characteristic fields and the course of the disease are all typical.

In two members the condition is uncomplicated and conforms entirely to Leber's original description. One member (Charles) also shows some degree of mental defect and infrequent epileptic attacks, features which, as we shall see, may occasionally be present. The fourth patient (Florence) shows, in addition to the characteristics of Leber's atrophy, the development of additional features of pyramidal disease, ataxia and sensory loss. The chief purpose of this paper and the main object in placing these family cases on record is to determine the nature of the spasto-ataxia exhibited by our fourth patient. We are naturally unwilling to diagnose a combination of two disorders in the same patient, although we feel that we cannot straightway dismiss the possibility of a co-existent disseminated sclerosis. In many respects the findings in this patient, eye changes apart, are compatible with such a diagnosis. These same features, however, including the eye changes and the cerebrospinal fluid changes, also occur in some of the heredo-familial disorders of the nervous system.

We realise, moreover, that in the case of one other member of the family (Charles) the symptomatology has shown a tendency to display features in addition to the optic atrophy. We are, therefore, tempted to regard the pathological condition in this family as an example of a neurone degeneration,

which has affected not only the optic nerve but also some other structures of the nervous system. In this way it would form a connecting link between Leber's atrophy and the wide group of the heredo-familial ataxies.

THE OCCURRENCE OF OTHER NERVOUS OR MENTAL SYMPTOMS AND SIGNS IN CASES OF LEBER'S ATROPHY.

Although the general statement holds true that Leber's disease is unassociated with any characteristic mental or physical defect, nevertheless we realize that some of the affected families are of what we might term degenerative stock. Leber himself called attention to this point ; in his original paper he wrote . . . . " in many of our families there occurred neurological appearances, chiefly of minor degree, so that these individuals are referable to the group of neuropaths (in the sense of Griesinger)*." He mentions that the patients and even the unaffected members of a family may suffer from periodic headaches, migraine, vomiting, giddiness, weakness, palpitations and teichopsia. They may be nervous and easily tired.

If one reviews a large series of cases of this disease, other positive findings, such as epilepsy or mental defect, may occasionally come to light. In his Bowman Lecture, Nettleship (1909) gave an account of all the cases of Leber's disease recorded to date. In nine instances (Leber, Story[5], Habershon, Snell[6], Higier[7], Keersmaecker[8], Stzeminski[9], Taylor[10], Lawford[11]), epilepsy occurred in families with Leber's disease, among either affected or unaffected members.

To these may be added the family recorded in 1821 by Travers[12], wherein three members became blind and epileptic at puberty. In this case, however, legitimate doubt may arise whether the familial disorder was not a cerebro-macular degeneration, although usually quoted as an instance of Leber's disease.

Insanity occurred in the family recorded by Story (associated with epilepsy) and also in an unpublished instance of French, quoted by Nettleship.

In the family recorded by Johnson Taylor one of the afflicted members suffered from " pins and needles " in the legs and cramps in the calves ; the tendon jerks were exaggerated. The brother—who also showed optic atrophy—likewise complained of dysæsthesiæ. The father was epileptic, but did not show any ocular signs.

Two of Taylor and Holmes'[13] patients complained of vague pains and paræsthesiæ in the legs and also showed some defect of bladder control. One of these also proved to be suffering from a co-existent tabes.

Out of six brothers with Leber's disease, recorded by Pines and Tron[14], three also showed nystagmus, tremor of the hands and brisk tendon reflexes. One patient was also peculiar in his behaviour and was of low grade intelligence.

* " Bei vielen unseren Kranken bestanden noch sonstige Erscheinungen von Seiten des Nervensystems, allerdings zum grössten Theil leichteren Grades, aber desart, dass die Individuen in die Klasse der Neuropathischen im Sinne Griesinger's zu rechnen sind."

Various degenerative anomalies were present in the members of this family—such as facial asymmetry, adherent lobes of the ear, forked tongue, syndactyly, and absence of hair from the face.

The first indication in the literature of any definite association of Leber's atrophy with nervous disease is to be found in a communication by Carl Behr[15] (1909). Under the title of "Complicated heredo-familial infantile optic atrophy" he gives details of six children in whom symptoms had been present since the earliest childhood. The main clinical features common to all his cases were :—

(1) *Optic atrophy ;* one case was observed definitely to develop after a retrobulbar neuritis ; fields of vision peripherally restricted ; central scotomata.

(2) *Pyramidal signs,* comprising slight rigidity, increased tendon reflexes. Babinski responses, but no definite diminution of muscular power.

(3) *Cerebellar signs :* nystagmus, inco-ordination, reeling gait, slow and monotonous speech.

(4) Slight intellectual defect.

(5) Weakness of bladder control.

(6) Presence of degenerative stigmata (cryptorchismus, adherent lobules of the ear, facial asymmetry, congenital cataract).

(7) In two cases there was some weakness of the extrinsic eye muscles.

Behr looked upon his cases as representing a transition type (Unterart) between Leber's disease and Strümpell's spastic paralysis on the one hand and the heredo-ataxias on the other.

Four years later another communication emanated from Behr's clinic in the paper of Takashima[16], who recorded six fresh cases of this anomaly. One of his patients was indeed the sister of two of Behr's original subjects. Takashima was able to throw further light upon Behr's cases by determining the stationary character of the disease. The commencement of the morbid process, he suggested, occurred in fœtal life or else during the first year of infancy.

Under the title of "Familial optic atrophy with tremor and intellectual deterioration" Imamura and Ichikawa[17] reported a Japanese family who showed positive neurological signs superimposed upon a Leber's atrophy. Their patients consisted of a brother and sister whose symptoms started in early adolescence. The brother (Monta) developed at the age of 18 misty vision which grew progressively worse. The optic discs were atrophic ; there were bilateral central scotomata, while the peripheral fields were full. Examination of the nervous system revealed some weakness of the right face ; eye movements inco-ordinate and jerky ; convergence poor ; nystagmus on extreme lateral deviation. No mental defect.

His sister (Tazu) developed at the age of 24 defective vision with some headache. Ophthalmoscopy revealed some hyperæmia of the disc and hazy outlines, but there was no swelling ; immediately round the disc was some pigmentary disturbance. She could count fingers at three metres

with the left eye and four metres with the right. There were central scotomata in both eyes. Fifteen months later the discs were atrophic ; the vision had deteriorated still more, and some peripheral restriction of the visual fields was demonstrable in addition to the scotomata. Her mentality was abnormal in several respects ; she was " euphoric, nonchalante, insouciante and almost always smiling." Cerebration was slow, memory poor and orientation vague. There was slight weakness of the right face ; fibrillary tremors were present round the lips and eyes, especially on emotional movement. On distant fixation, one or other eye tended to swing outwards. Convergence was poor. Nystagmus was absent. Tremor was present in the trunk, tongue, and fingers, and was aggravated by voluntary movements. The limbs were rigid, especially the arms, and fine movements were inco-ordinate in execution. The reflexes were normal.

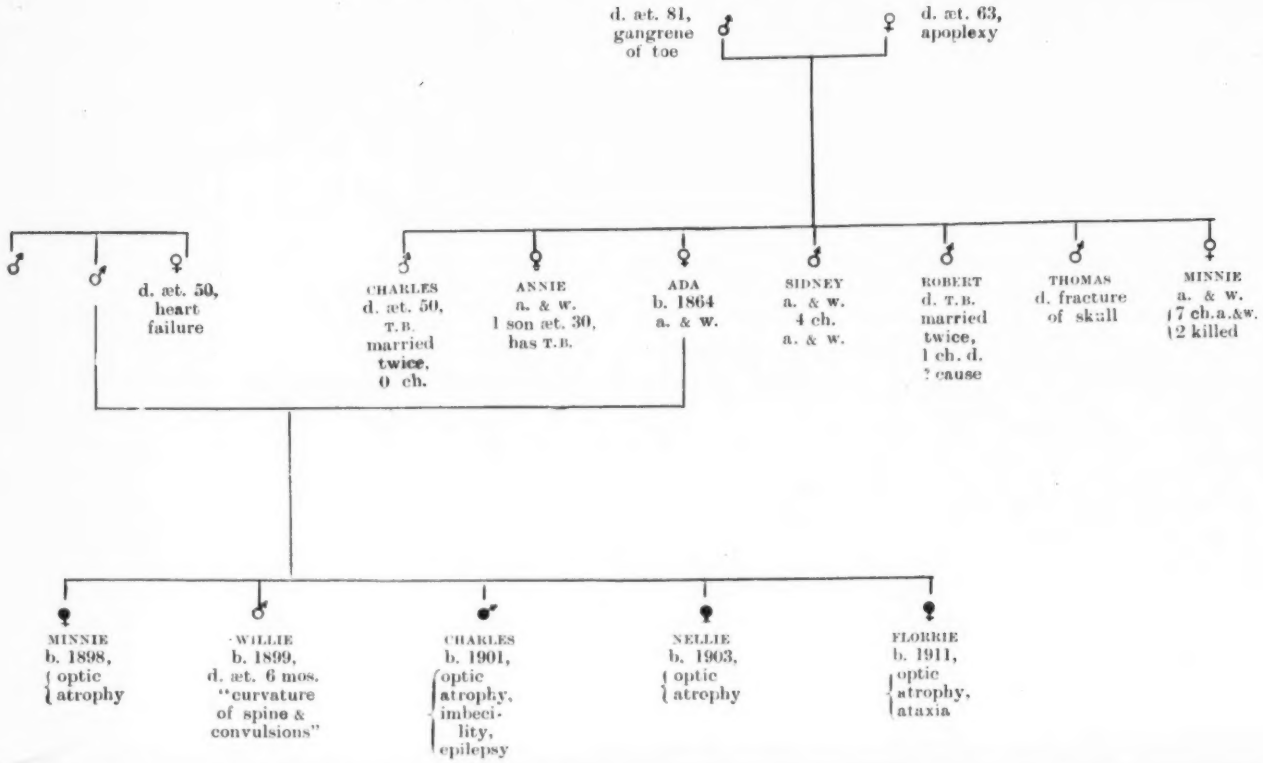
Imamura and Ichikawa were inclined to regard their cases as exemplifying a type intermediate between Leber's disease and Behr's optic atrophy.

So far, the cases described bear some resemblance to each other and also to that of our fourth patient, in that visual defects due to optic atrophy occupied the centre of the clinical picture. In this respect the cases of Behr and of Imamura and Ichikawa probably constitute the solitary examples in the literature. The age of onset in the twelve recorded cases of Behr's atrophy obviously constitutes a distinct differentiation from that of our fourth patient ; from the standpoint of history as well as of symptomatology the two Japanese patients bear a closer resemblance to Florence N.

Apart from these clinical types just mentioned there are of course several other varieties of heredo-ataxia or hereditary combined diseases of the cord in which optic atrophy is a characteristic finding. Thus the cases in the families recorded by Freud[18], Nonne[19,20], Bach[21], Sanger Brown[22] (which may all, if desired, be considered under the comprehensive category of Marie's ataxia[23]) bear in their complete form some resemblance to our fourth case. But in each of these instances the optic atrophy occupies a comparatively unimportant place in the symptomatology, and disorders of gait or of movement antedate and outweigh the defects of vision. Our fourth patient is rather a case of Leber's disease with neurological signs than of familial ataxia with an incidental optic atrophy.

It is obvious that in many cases it is almost impossible to place a particular case into a definite class—features of more than one disease apparently co-existing. At one end of the scale there is the simple, uncomplicated heredo-familial optic atrophy ; thence we pass through a stage where the family shows a neuropathic tendency or where there is a definite tendency to migraine or epilepsy. Next come those cases (Behr, Takashima) where optic atrophy and neurological signs co-exist, both appearing early in infancy. Parallel with these are the cases in which optic atrophy and neurological signs co-exist but appear in early adolescence (so far represented alone by our fourth patient and by Imamura and Ichikawa's family). By this process of transition we are

GENEALOGICAL TABLE OF THE N. FAMILY.


d. æt. 81, gangrene of toe
d. æt. 63, apoplexy
d. æt. 50, heart failure
CHARLES d. æt. 50, T.B. married twice, 0 ch.
ANNIE a. & w. 1 son æt. 30, has T.B.
ADA b. 1864 a. & w.
SIDNEY a. & w. 4 ch. a. & w.
ROBERT d. T.B. married twice, 1 ch. d. ? cause
THOMAS d. fracture of skull
MINNIE a. & w. 7 ch. a. & w. 2 killed
MINNIE b. 1898, optic atrophy
WILLIE b. 1899, d. æt. 6 mos. "curvature of spine & convulsions"
CHARLES b. 1901, optic atrophy, imbecility, epilepsy
NELLIE b. 1903, optic atrophy
FLORRIE b. 1911, optic atrophy, ataxia

led up to the well-defined heredo-familial ataxias (Marie) in which optic atrophy occurs, but the motor phenomena are the outstanding features. At the extreme end of the scale one may place Friedreich's ataxia as representing a type of cerebellar disease in which optic atrophy occasionally occurs.

CONCLUSIONS.

Apart from its intrinsic rarity, the familial condition recorded in this paper is of importance in that it may throw some light upon one or two neurological problems of interest. In the first place, by representing a probable transition type between Leber's disease and Marie's ataxia, it tends to support Raymond's unitary conception of the heredo-familial affections of the nervous system.

Secondly, the association of neurological findings may contribute to our knowledge of the etiology of Leber's disease, by suggesting that the essential pathogenic process is a neuronic abiotrophy, limited—in typical cases—to the optic nerve. The presence of a neuritis in the early stages may appear to argue against this conception of a degenerative origin, but there are two further possibilities which will reconcile these apparently contradictory views. Thus the products of degeneration may of themselves be of such a toxic nature as to cause a superadded inflammation to the affected optic nerve; or, the optic nerves may possess merely an inherent vulnerability which requires the intervention of some added factor (such as sepsis in the adjacent structures) to develop neuritis and consequent atrophy. Both hypotheses are compatible with our conception of Leber's disease as a familial abiotrophy of the optic nerve which may in rare instances be accompanied by degeneration in other parts of the nervous system.

We beg to acknowledge our thanks to Dr. Grainger Stewart for permission to publish the case under his care, and to Sir William Lister for his kindness in so readily giving us information concerning the N. family.

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UNUSUAL SENSORY PHENOMENA FOLLOWING REMOVAL OF A TUMOUR OF THE SENSORY CORTEX.

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The case here reported presented several unusual features, the most interesting of which were the variations in the appreciation of the shape, size, form and nature of objects for a short period following the removal of a tumour from the postrolandic cerebral cortex. It is with the object of placing on record the observations made upon these phenomena that the case is published. It is necessary, however, in order to indicate the background upon which the phenomena appeared, to describe the whole case in detail.

CLINICAL CASE.

E. E., male, age 48 years, was admitted complaining of (1) difficulty in using the right arm and leg; and (2) attacks of "pins and needles" associated with movements on the right side. The symptoms had been present for fifteen months, but there had been some difficulty in moving the right foot for ten years.

History of Present Illness.—In 1918 the patient was wounded by a piece of shrapnel which passed through the back of the right thigh, and by other pieces which lodged in the inner side of the right ankle. After nine months in hospital he recovered and was discharged from the army with "slight foot-drop" on the right side. Excepting for a slight limp he was perfectly well until fifteen months before admission.

The present illness began suddenly fifteen months before admission with an attack of "pins and needles," which started in the right foot and travelled up the right leg. Following this attack, all movements of the right foot were lost for a time, but after a short interval the foot could again be moved a short distance upwards. There was no further attack for six months. The second attack occurred six months before admission. It began with "pins and needles" in the right foot; this sensation travelled up the right leg; convulsive movements appeared at the right knee; the sensation passed up the right side of the body to the neck; convulsive movements appeared at the right shoulder; the sensation then travelled to the right side of the face and down the right arm to the finger tips.

During the next nine months the attacks occurred in series at intervals of about one week. After each, the right arm and leg were useless but recovered in from five to six hours. The attacks varied in intensity; they were often slight and produced little general disturbance; but on one occasion it was so severe that the patient fell to the floor and was unable to move for three hours. In none was consciousness lost.

Since the first attack there had been some motor disability on the right side. This appeared first in the right foot, then in the whole leg and finally also in the right arm. The right side of the face became weak shortly before admission.

Speech was sometimes affected either at the end of or after the attack. As far as the patient could remember, the speech defect appeared first when the march of the sensation

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had almost ceased and persisted for a few minutes after the attack had ended. During the previous three months, it had been noticed that he sometimes "stuttered" when he became excited.

Each attack was succeeded by extreme exhaustion, a feeling of depression and a sensation of "pain and tenderness on the top of the head." Headache, which usually appeared as "a sense of pressure on the top of the head but deep in," sometimes persisted for twenty-four hours and sometimes for five days. A tender area was often felt on the scalp a little to the left of the middle line.

Vision was not obviously impaired but spots sometimes appeared in front of the eyes. The sight of the left eye had been defective for many years following a blow on the eyeball.

There was a slight sensation of giddiness on turning to the right. This had been present more or less all the time since the onset of the illness, but was severe on only two occasions when, on turning to the right, equilibrium was completely lost. There had been no vomiting. The organic functions were normal.

Pain had been present constantly, "deep in the right arm below the shoulder," for fifteen months, and had been very severe during the last two months. There had been frequent attacks of crying and sobbing "as though his heart would break" for half an hour at a time. Such attacks appeared frequently for two or three days in succession, during which the patient would have to lock himself away from other people. They had become much more severe and frequent during the last four months. On two occasions, the first four months before admission, the patient had become much more hilarious than was usual for him; he could not stop laughing and had to leave the room for some time until the laughing ceased of its own accord. During the fifteen months he had always felt unusually distressed when he saw a child suffering pain and felt that he himself experienced all the pain the child suffered. Though he had never known what fear was, he had on two occasions been aware of a feeling of extreme dread for no apparent reason. On the first occasion, when he had reached a seat in the back of the circle of a theatre, he at once "felt an awful dread of falling forward into the pit below." He felt so terrified that he had to get a transfer to a seat on the ground floor, and when he reached it the fear disappeared. He had this experience four months before admission and again had the same feeling two months later in the same part of another theatre. The attacks of sobbing were much more likely to occur on what were described as "depressing days," when the patient also felt cold and shivered so much that he had to don warmer clothing. There had been no sensations of warmth. Throughout the whole of his illness the patient had been exceedingly reticent about his emotional experiences because he was afraid that people would think he was parading a war disability.

Previous History.—Twenty-eight years before he had received a blow on the head and was not well until two weeks later. In addition to the wounds mentioned above he received a superficial shrapnel wound in the right temporal region. The family history was negative.

Condition on Examination.—His mental condition was normal. Memory, attention and cooperation were perfectly good.

Cranial Nerves.—The pupils were small, equal and reacted normally. Vision was normal in the right eye, but limited to the perception of fingers in the left eye. There were no obvious changes in the visual fields. Optic discs and fundi: on the right side the fundus was normal; there was a large patch of opaque nerve fibres at the upper and outer disc margin; the physiological cup was not obliterated; the outline of the disc was blurred; the surface was apparently raised and the veins were distended and pulsating. On the left side the view of the fundus was obscured by the presence of small lenticular opacities. Ocular movements were normal; there was no nystagmus; hearing was normal and equal on the two sides. Speech: there was some hesitation over individual words; he complained that sometimes, if the idea were difficult, the words would not come though he knew what he wanted to say. Trigeminal nerve: the jaw swung a little

to the right on opening; otherwise normal. Facial nerve: voluntary movements were weak on the right side; emotional and associated movements were equal and normal. The other cranial nerves were normal.

Sensory System.—Spontaneous abnormal sensations: sensory attacks confined to the right side as described in the history; pain deep in the right arm. Objectively, slight impairment of cotton wool touches over the right arm and leg and the right side of the body, most evident over the lower third of the leg and foot. Pain: the finer variations were impaired over the area indicated above, compared with the left side. Thermal: the finer variations were impaired in the above area. Deep pressure: normal in the right arm; impaired in the right leg. Posture: good in the right hand and fingers; absent in the right ankle and toes. Vibration: impaired in the right arm and leg compared with the left. Localisation: impaired in the right arm; a longer period elapsed before the response than on the left side. Appreciation of size and shape: there was slight impairment over the right hand and more over the right leg. All forms of sensibility were impaired over the body and limbs on the right side as compared with the left.

Motor System.—Upper limbs: the left arm was normal; the right arm tended to assume a position of flexion; tone was increased especially in the flexors; motor power was diminished for all movements; supinator, biceps and triceps jerks were exaggerated and more active than those on the left side; Léri's forearm sign was present; the Mayer sign was absent; and the Klippel-Weil sign was present.

Lower limbs: the left leg was normal; the right leg showed a tendency to assume a position of full extension; tone was increased especially in the extensors; motor power was diminished for all movements; the knee-jerks and ankle-jerks were exaggerated and more active than on the left side; patellar and ankle clonus was present; and the plantar reflex resulted in dorsiflexion. The abdominal reflexes on the right side were less active than those on the left and they tired more rapidly.

Gait: the right leg swung in a semicircle from the hip, was thrown forward and brought to the floor with a stamp.

Spontaneous movements: clonic movements were present at intervals in the right quadriceps.

Coordination: with the finger-nose test there was a coarse tremor of the right arm and hand at the end of the movement, increased with the eyes closed; there was no Rombergism. The sphincters were normal.

Cerebrospinal fluid: not under increased pressure; clear; two small lymphocytes per c.mm.; total protein, 0·04 per cent.; no excess of globulin; Wassermann reaction negative; Lange test—0122100000. Blood: Wassermann reaction negative.

Skull: there was a small tender area over the vertex on the left side of the middle line and about the upper limit of the fissure of Rolando. X-ray of the skull: there was a gap in the inner table about the mid-point of the vertex; as this corresponded with the fontanelle, it was regarded as a normal finding.

The digestive, cardiac, and respiratory systems were normal. The blood-vessels were normal. Pulse: 80, regular; blood pressure—115 systolic, 80 diastolic. Vasomotor system: on two occasions the right hand swelled and became cyanosed; on each occasion the swelling disappeared during the night; the right arm and leg were definitely colder to the touch than the left.

Subsequent progress: Two attacks were observed. The first occurred during the night and lasted eighteen minutes. A tingling sensation was felt in the toes of the right foot; convulsive movements then appeared there; the sensation travelled to the right knee; movements appeared there; the sensation then travelled up the right side of the body to the right side of the face and head; movements appeared at the right shoulder; and the sensation then travelled down the right arm to the finger tips. The patient was conscious throughout the attack; but towards the end of it he was unable to speak. The right arm and leg were flaccid for five hours afterwards.

A second attack occurred after an interval of ten days and was observed personally. Tingling developed in the toes of the right foot and slowly travelled to the right knee; movement then commenced in the toes and spread up to the knee. Up to the middle of the body the movements followed behind the sensation but there overtook it and spread to the right shoulder. Meanwhile the sensation travelled up the right side of the body to the face, at which stage the movements at the shoulder ceased. The sensation then travelled slowly down the right arm to the finger tips. The patient was conscious throughout the whole attack; his speech was unaffected, and he could describe the position of the sensation from stage to stage. In the body the movements were bilateral and could be felt marching up the trunk part by part. In the neck, violent movements resulted from contractions of the right sternomastoid before movements of the arm commenced. Contractions of the left sternomastoid also occurred but it was not at all certain that they were not due to the general movements of the head as a result of the contractions of the muscle on the other side. Immediately after this attack, slight tingling was felt again in the toes of the right foot but did not spread elsewhere. The right arm and leg were flaccid and did not recover their normal tone and power for forty-five hours. During that time the patient was generally depressed, and complained that whenever he attempted to use the right arm or leg he felt "a sense of pulling or pressure in the head," over the whole vertex but more obviously on the left side than on the right.

Surgical Treatment.—A diagnosis was made of a neoplasm of the postrolandic sensory cortex on the left side, with involvement chiefly of the leg area close to the middle line and of the parts adjacent to it anteriorly and laterally. The operation was performed by Mr. Cecil P. G. Wakeley. A large osteoplastic flap was turned back from the middle line on the left side and the left cerebral hemisphere in front of and behind the fissure of Rolando exposed. The membranes bulged through the wound excepting close to the middle line. On incising the dura it was found to be adherent to the underlying structures over the postrolandic cortex close to the middle line. In this situation the tissues were not displaced into the wound following the incision of the dura but elsewhere the brain tissue expanded into the wound. A large tumour was shelled out from the site of the postrolandic cortex close to the middle line. It occupied the whole of the leg area, was slightly overlapped by the brain tissue all round and displaced the brain tissue mainly inferiorly but also laterally, anteriorly and posteriorly. The dura, osteoplastic flap and scalp were closed in the usual way.

Pathological Report on the Tumour.—The pathological report on the tumour, provided by Dr. W. E. Carnegie Dickson, was as follows. The tumour consisted of a hemispherical mass about half the size of a small to medium sized orange, two and a quarter to two and a half inches in diameter and one and a half inches thick (*vide* Figure). Its surface was lobulated and simulated the surface appearance of the brain in colour and appearance but was more irregular. The tumour was fairly firm and on section showed a more or less homogeneous slight yellowish-white appearance. On microscopical examination the tumour was much "whorled" but showed no psammomata or calcification. There was a considerable amount of fibrous tissue framework, and the tumour-cells were not of the actively malignant type but probably mildly and locally so. The tumour was a meningioma.

Post-operative Findings.—Observations commenced an hour and a half after the operation when the patient had recovered from the anæsthetic. He was then able to speak freely and could produce a sentence of five or six words with ease. Occasionally, he stressed each word with great emphasis and definitely paused between individual words. Sometimes he found difficulty in producing a word he wanted to say, and paused for an appreciable interval before he could say it. He complained of slight pain in the right leg and of a very severe pain "deep in the right arm above the elbow." There was conjugate deviation of the eyes to the left and a persistent tendency to rotate the head towards the right. The right arm and leg were completely flaccid and on the right side no tendon reflexes could be elicited.

Five and a half hours after the operation the speech defect was more pronounced and the conjugate deviation of the eyes and the tendency to rotate the head had disappeared. Nine and a half hours after the operation the difficulty in finding words was more pronounced and more frequent. The patient would say three or four words perfectly well, then stop and indicate that he could speak no further. After a short rest he could proceed as before but soon met with the same difficulty.

Twenty-four hours after the operation his condition was as follows. The speech defect was worse. The patient complained that after saying about three words with ease, when he wanted to say the next word, several seemed to come into his mind at once and he had difficulty in choosing the right one. Following this he could not speak at all until he had a rest. He hesitated frequently and often could not complete a word he had begun. There was slight weakness of the right side of the face for voluntary movements. Upper limbs: motor power was completely absent in the right arm; there was some return of tone to the flexor muscles; and the tendon jerks were more exag-

Photograph of Tumour—actual size (Dr. Carnegie Dickson).

gerated than those on the left side. The abdominal reflexes were absent on the right side. Lower limbs: motor power was poor; there was slight spasticity in the right leg; the right knee jerk was more active than the left; and the right plantar reflex resulted in dorsiflexion.

On the second day the speech condition was unchanged. Pain "deep in the right arm" was still present; but there was no pain in the leg. "Twitching movements" appeared at intervals in the right foot.

On the third day the attacks associated with movements of the right foot were continuing as before. An attack associated with movements of the right side of the face and of both upper eyelids was observed in the evening. A twitching movement appeared at the right angle of the mouth and was followed immediately by clonic blinking movements of both upper eyelids. The two movements then proceeded together until the end of the attack which often lasted as long as three or four minutes. During the attack the patient could not speak but was able to point to the site of the movement and indicate when it had spread to the eyelids. Following each attack the right arm was more flaccid and its tendon reflexes less active than before. On each occasion the attack was induced on attempting to speak.

On the fourth day the attacks appeared as on the previous day, both on trying to speak and sometimes when no attempt was made to do so. On each occasion, after a rest of a few minutes, the patient was able to speak freely. There was a "feeling of pulsation" in the right hand and a sensation of "pins and needles" both there and in the right foot. Sympathetic induction of emotion was still very active, for the patient was deeply distressed and felt pain acutely when an operation case was returned to the ward. The tendency to this sympathetic emotion decreased very much during the week following the operation and after that was less easily aroused.

The difficulty with speech was at its maximum on the fifth day. Up to that time the periods of aphasia had steadily become more frequent and longer until they persisted for as long as ten minutes at a time. They occurred chiefly in association with the local twitching movements of the face and eyelids. The patient explained that after he had said a few words he felt "as if the brain got tired; he finally got to the stage when he got only part of a word out and then no words would come."

On the seventh day the local "fits" which had been present for four days no longer appeared, and the difficulty with speech was no worse than it had been before the operation.

On the twentieth day there was still slight impairment of cottonwool sensation over the right arm, but the appreciation of pain was as good as before over the left arm. Free voluntary movements of the fingers and toes were possible on awakening from sleep but soon tired. Over the leg there was a slight difference in cottonwool sensation between the right and left legs; and the same difference was apparent for pain and thermal sensations. Changes of position were appreciated in movements of the right ankle but not in those of the toes. Vibration sense had improved in the right leg but was still less easily appreciated than in the left leg. There was slight impairment of deep pressure sense in the right tendo Achillis. Movements at the right hip were good, at the knee they were possible in all directions but weak, while at the ankle and toes there were limited movements of flexion and extension. Movements of the toes appeared for the first time since the onset of the illness. Five weeks after the operation speech was normal, movements of the right arm, ankle and toes could be performed much more freely and for longer periods, and the appreciation of sensation of all types was as good on the right side as on the left.

Spontaneous "Stereognostic" Sensations.—As soon as the patient became conscious on recovering from the anæsthetic he thought he was holding an object in the palm of the right hand. So real was the impression that he felt with the left hand to find if there was actually anything there. During the first two days, this sensation was constantly present and very definite. The shape and size of the objects felt and the objects the patient recognised varied from time to time. At one time he felt a smooth, round object which he described as "like a ball which just fits into the palm of my hand." Again, he felt "something rough and jagged and hard like a piece of road granite." Later he felt "a flat round object—like a ladies' small mirror." He also felt "a long, round object like a long, round pencil case," and an object "like a matchbox." Not only did he appreciate the size, shape and consistency of the object but he was able either to recognise it or to compare it with an object well known to him.

On the third and fourth days these sensations were still present and very real to the patient but appeared at gradually increasing intervals. They were, however, not so obvious as on the two days immediately after the operation. At this stage, he discovered accidentally that, when a thermometer was placed in the palm of the left hand, he could also feel an object of the same size and shape which he recognised as "another thermometer" in the palm of the right hand. When an object such as a matchbox, a penny or a fountain pen was placed in the palm of the left hand he felt it perfectly well there and was able to recognise it, but at the same time he also felt a fainter sensation of the presence of another object exactly the same in the palm of the right hand. When a silk handker-

chief was placed in the left hand he had the same sensation of the presence of a soft silky material in the right hand, though less pronounced than in the left hand. A further test suggested that thermal sensation was also involved in this phenomenon. When a cold penny was placed in the palm of the left hand there was at once a transient feeling of coldness in the right hand as if a cold object had been placed therein. He volunteered the statement that this sensation of coldness in the right hand persisted only as long as did the feeling of coldness in the left hand on first feeling the penny. He could appreciate gross variations in size and shape when an object was placed in the right hand but failed to appreciate the finer variations. He could recognise the general shape and size of a watch but failed to recognise its handle. When an object such as a fountain pen was placed in the right hand he recognised its general size and shape but could not identify it; when it was withdrawn gently the sensation of its presence there persisted for at least one minute afterwards. With successive tests this persistence of sensation became weaker and weaker and finally disappeared.

The spontaneous sensations of objects in the right hand were less frequent and fainter on the fifth and sixth days, and on the seventh day had entirely disappeared. The sensation of the presence of an object in the right hand when one was placed in the left hand had also disappeared at the same time. In addition, as mentioned above, the speech defect had reverted to the pre-operation condition, the local fits in the right side of the face, eyelids and foot no longer appeared, and the "pins and needles" in the hand and foot had disappeared.

On the ninth day there was a slight return of the feeling of the presence of a body in the right hand. The patient felt that the right hand was full, waited for some time to see if he could recognise the object therein, failed to do so, moved the left hand across, straightened out the fingers and then the sensation at once disappeared.

There was a further return of the phenomenon on the twelfth day. The patient had been smoking a cigarette and holding it between the first and second fingers of the left hand. About fifteen minutes after he had finished and discarded it, he felt that he was holding a cigarette between the first and second fingers of the right hand. The sensation was quite as definite as that produced when he was actually holding the cigarette between the fingers of the left hand. He felt that there was something between the two fingers of the right hand and at once recognised it as a cigarette. He then felt with the left hand between the first and second fingers of the right hand, separated and rubbed them and the sensation then disappeared. On the twenty-first day the patient felt, on placing a cigarette in his mouth, a box of matches in the right hand. On the twenty-fourth day indefinite sensations of something in the right hand were constantly present. From the twenty-sixth day to the thirty-second day the sensations were very definite and the patient felt objects such as boxes and coins in the right hand. After that the sensations became indefinite and faded away.

DISCUSSION.

The most interesting features of the case described were those concerned with the appreciation of size, shape and consistency. These exhibited three different forms, viz. :—

(1) Spontaneous "stereognostic" sensations in the right hand, most pronounced immediately after the removal of the tumour, gradually decreasing during the following six days, disappearing on the seventh day, but reappearing at infrequent intervals for five weeks after the operation.

(2) A feeling that objects were present in the right hand when they were actually present and felt in the left hand, a sensation which was at its maximum on the fourth day after the operation.

(3) Persistence of sensation in the right hand after an object had been removed from it.

In order to understand the circumstances under which these sensations appeared it is necessary to review the condition and habits of the patient from the onset of his illness. For fifteen months at least a tumour had been present impinging upon the cerebral cortex immediately behind the fissure of Rolando close to the middle line, displacing this portion of the cortex and adjacent brain tissue below and also at a later stage displacing the neighbouring tissues in front of, lateral to and behind it. Definite symptoms of interference with both the sensory and motor areas of the cerebral cortex for the leg had been present since the onset, and had gradually increased in such a way as to suggest that the greater part of both areas had become more or less involved. Though, during this time, the patient was still able, save for a short period after each attack, to grasp large objects with the right hand and to use it for purposes which did not require the appreciation of the finer degrees of sensation for their performance, the increasing motor disability in the right arm and hand had compelled him to rely more and more upon the left hand for the handling of small objects. This gradual education of the left hand in actions usually performed by the right hand had proceeded for nearly fifteen months. In addition there was some evidence of disturbance in the optic thalamus and neighbouring structures on the left side in the form of pain deep in the right arm, emotional disturbances and tremor in the right hand and arm on movement. Such disturbances were probably due as much to interference with the circulation as to anything else, as were also the symptoms of interference with those portions of the motor and sensory cortex previously mentioned. At the operation a tumour was shelled out from a cavity formed by the displacement of the pre- and post-rolandic areas of the cerebral cortex close to the middle line. With the removal of the tumour the cavity filled with blood clot and the circulation in the compressed portion of the cerebral tissues and those adjacent to them was probably much disturbed. Because of the replacement of the tumour by blood clot and the extreme degree of displacement of the parts immediately adjoining the cavity, those parts which were at some distance from it were probably affected to a greater extent by changes in the circulation than were those immediately adjacent to it. That this was probably true was supported by the occurrence of speech defects, tingling in the right hand and motor Jacksonian fits confined to the right side of the face and the eyelids, all reaching their maximum on the fifth day after the operation and then gradually decreasing until the seventh day, when they no longer appeared. That something was also happening but in a lesser degree to the motor and sensory areas for the leg close to the middle line was suggested by the appearance of tingling and "twitching" movements in the right foot on the second and third days after the operation. That there were also variations in the deeper-seated structures was suggested by the rapid diminution in sympathetic emotion, a feature of the illness which had caused the patient much distress before the

operation. It was probable that, following the removal of the tumour, there was an increase in the circulation of the parts surrounding the cavity, reaching its maximum about the fifth day and then gradually returning to normal; whereas the circulation of those parts immediately adjacent to the cavity was readjusted in a much more gradual manner. Such then was probably the pathological background upon which the sensations to be described were based.

The first variation in sensation to be discussed is that which for convenience has been termed spontaneous "stereognostic" sensation. The details of the phenomenon have been described under the clinical features of the case and it is necessary only to mention that the patient had at different times the sensation of the presence of bodies of different sizes, shapes and consistencies in the palm of the right hand; that he sometimes merely compared the objects thus felt with objects well known to him, but more often actually recognised them as such without any hesitation; and that these sensations were present constantly for the first two days after the operation and appeared at increasing intervals and less obviously thereafter. Objects such as "a smooth, round ball," "something rough and jagged and hard like a piece of road granite," "a flat, round object like a ladies' small mirror," "a long, round object like a long, round pencil case," a matchbox and a cigarette were felt at different times. At first the sensation of the presence of an object in the right hand was so real to the patient that he had to feel with the left hand to be sure there was nothing there. Subsequently, however, there was some difficulty in recognising the object though there was no doubt in the patient's mind that there was something there. On one occasion the sensation of the presence of a cigarette in the right hand appeared fifteen minutes after the patient had been holding a cigarette in the same position in the left hand. On another occasion, three weeks after the operation, the patient wanted a box of matches, felt that he was holding it in the right hand, but on feeling for it with the left hand found that it was not there but lying on the bed.

Some clue to the features associated with the phenomenon was supplied by the observation that on one occasion passive movement of the fingers of the right hand caused the sensation to disappear, while on a second occasion passive movement of the fingers and rubbing them caused it to disappear. Thus it was suggested that the position in which the fingers of the right hand chanced to be had something to do with the feeling that an object was present therein. This suggestion was supported by the fact that after the gentle removal of an object from the right hand, the sensation of its presence there persisted until a movement of the fingers dispelled it. Unfortunately, after this aspect of the question had been appreciated, there arose no further opportunity of deciding whether the position of the hand and fingers at the time corresponded with that in which they would have to be to grasp the object which the patient felt was present. It was, however, noticed by the patient that in each case the hand and fingers were in the position they would have to be

to hold the object felt, with one exception that when feeling a ball the hand was in a position different from that which it usually assumed when the patient was holding a ball.

It is probable, however, that there were other factors concerned in the production of the spontaneous sensations. It was known that there was some disturbance, probably circulatory in nature, involving the parts concerned with the motor aspect of speech, the motor areas for the facial movements and the movements of the eyelids, and the sensory area for the hand for at least one week after the operation ; and that this disturbance revealed itself in the form of " motor " aphasia, motor Jacksonian fits confined to the right side of the face and the upper eyelids, and tingling in the right hand. It is reasonable to suppose therefore that this disturbance played some part in the production of the spontaneous " stereognostic " sensations experienced by the patient. Sensations of a similar type occur in association with local lesions in other parts of the brain and are usually definitely related to the function of the part concerned. The sensations of smell occurring in connection with lesions of the uncinate gyrus are of this type, and vary in different subjects in their resemblance to smells previously experienced. Such easily recognised smells as those of lysol and of chloroform have been experienced by patients observed by the writer. Perhaps lesions of the optic radiations and the visual centres provide a more useful analogy. For example, lesions of the visual centres may be associated with " unformed " sensations such as flashes of light and colour while those involving the optic radiations further forward result more frequently in visual hallucinations which take the shape of " formed " objects, such as figures in fancy dress, as in one case observed by the writer. It is possible that this analogy will explain the occurrence of spontaneous sensations involving the association of tactile sensations, sensations of deep pressure and the sense of position in the case under discussion. It is known that motor or sensory Jacksonian fits occur as the result of a local lesion at or near the particular part of the cortex concerned in those who are predisposed to them. Such fits, when of the sensory type, usually take the form of simple sensations such as tingling or " pins and needles," and are thus analogous to the flashes of light and colour which occur sometimes with lesions at or near to the visual cortex. Of this type of fit the earlier history of the case under discussion provided numerous examples. It is suggested that a lesion at or near the surface irritates or releases the functions of widely divergent sensory structures in such a way that they can be interpreted by the higher centres as only " unformed " sensations. If lesions of the suprathalamic sensory structures at a lower level be regarded as analogous with those of the optic radiations far forward, it might be expected that a lesion there, such as might be produced by comparatively widespread circulatory changes, would produce a definite spontaneous " formed " sensation which would result in the recognition by the patient of an object of the same size, shape and consistency as one which he had felt previously. The explanation suggested is that a disturbance affecting the sensory structures

at or near the surface initiates sensory impulses which are so scattered and relatively infrequent that when associated at a higher level they can be recognised as only the simpler forms of sensation, whereas one affecting the sensory structures at a deeper level, where they are more closely arranged, initiates sensory impulses which are so numerous and varied that when associated they can be interpreted by the higher centres as due to objects which have the properties of size, shape and hardness or softness. It seems reasonable to suppose that such a temporary disturbance probably occurred in the case reported, and initiated by " irritation " a flood of sensory impulses to the higher centres, where they were interpreted as due to the presence of an object of which the patient had had previous knowledge in the hand from which the fibres irritated normally conveyed sensory impulses.

In connection with the optic radiations a similar phenomenon in the form of a periodical visual hallucination was observed by Pavlov in a dog in which a portion of the " cortical cutaneous analyser " had been extirpated. It was suggested that this was " probably due to the distortion of the effect upon the cortex of the external visual stimuli by local, internal stimuli originating in the extending scar," and that " many similar cases of illusions in man are probably due to the interference of similar cortical stimuli of internal local origin." It might be asked why lesions of the suprathalamic sensory structures do not result more often in spontaneous " stereognostic " sensations. It is possible that in many cases they are overlooked because the patient does not regard them of any importance, and in most cases that the lesion is so extensive and severe that the transmission of sensory impulses is impossible. The conditions necessary for the occurrence of such sensations would appear to be the presence of a lesion involving only a portion of the sensory structures and leaving the remainder only slightly or not at all affected.

There is yet another possible explanation of the curious sensory phenomena which occurred in this case, viz., the effect that a local lesion such as a tumour, followed by the effects of its removal, would have upon all the other cerebral functions, including those which are usually grouped under the heading of psychical processes. It was evident that following the operation a serious degree of mental fatigue was present, as was shown by the manner in which the speech defects arose ; and it is possible that this might have been responsible for the confusion and misinterpretation of sensations. The most obvious form of confusion was the feeling that an object was present in the right hand when one was placed in the left hand, while at the same time its presence in the left hand was fully appreciated by the patient. The placing of a thermometer, a fountain pen, a matchbox, a penny or a cigarette in the left hand produced in every case the feeling that a similar object was present in the same position in the right hand. In addition, a silk handkerchief was felt in the right hand as well as in the left, and the sensation of coldness produced by placing a cold penny in the left hand was appreciated in the right hand as well. That some higher cerebral process was probably involved was suggested by an

experience which the patient had as late as three weeks after the operation, when on placing a cigarette in his mouth he immediately felt the necessary box of matches in the right hand. The "crossing of sensations" occurred only during the first week after the operation. The normal sensory impulses from the left hand were correctly interpreted as being due to an object in the left hand, and it is possible that the abnormal impulses arising at a higher level were at the same time interpreted as being due to a similar object in the right hand.

In this connection an observation already mentioned is of some interest—the fact that the sensation of the presence of a "phantom" cigarette in the right hand was appreciated fifteen minutes after one had been held in a similar position in the left hand. On this occasion there was, of course, no sensation of the presence of a cigarette in the left hand at the same time. It is possible that during the education of the left hand in the handling of objects usually handled by the right hand, a similar "lead" had been given to the interpretation of the impulses arising at a higher level on the opposite side as a result of the changes following the operation, quite apart from the experience in handling objects with the right hand before the onset of the illness. It was significant that the objects felt were confined to those which the patient had at some time held in his left hand during his illness. That fatigue was at least a factor in the development of the sensations was suggested by the fact that they did not as a rule occur after a period of sleep and they decreased in intensity as mental fatigability lessened during convalescence.

These suggestions as to the cause of the sensory phenomena described are merely put forward tentatively. It is possible that all three of the factors mentioned played some part in the production of the sensations experienced by the patient.

SUMMARY AND CONCLUSIONS.

1. The history, clinical investigation, operative treatment and post-operative symptoms of a case of meningioma of the postrolandic sensory cerebral cortex are described in detail.

2. Following the operation at which the tumour was removed three types of abnormal "stereognostic" phenomena occurred, viz. :—

   (*a*) Spontaneous sensations of the presence of solid objects in the affected hand ;

   (*b*) Sensations of the presence of solid objects in the affected hand when they were actually present and felt in the unaffected hand ;

   (*c*) Persistence of the sensations of the presence of objects in the affected hand for an appreciable interval after they had been removed therefrom.

3. The probable causes of these sensory phenomena are discussed, viz :—

   (*a*) The effect that accidental positions of the affected hand might have in the production of spontaneous "stereognostic" sensations ;

(*b*) The effect that local impulses, arising in the sensory structures immediately above the thalamus as a result of post-operative circulatory changes in that region, might have in the production of spontaneous "formed" sensations, in contrast with the effect of lesions of or close to the cerebral cortex in the formation of spontaneous "unformed" sensations;

(*c*) The effect that post-operative mental fatigue might have in the misinterpretation of the local sensory impulses arising at the suprathalamic level.

4. It is possible that the local sensory impulses arising as the result of post-operative circulatory changes immediately above the thalamus were the main factor and that mental fatigue and accidental positions of the affected hand were contributory factors in the production of the sensory phenomena described.

The writer wishes to thank Dr. Neill Hobhouse, Mr. Cecil P. G. Wakeley and Dr. Carnegie Dickson for permission to publish the notes of this case.

SOME MEDICOPSYCHOLOGICAL PROBLEMS IN INDUSTRY.

By MAY SMITH,

[Investigator to the Industrial Fatigue Research Board].

In the course of investigations undertaken on behalf of the Industrial Fatigue Research Board one frequently comes up against problems of a medico-psychological nature which urgently need solution. It is difficult to allocate them to any particular branch of medicine or psychology; at the moment they seem to belong to a kind of medical no-man's-land. Perhaps they are best summed up as problems of temperament, although what exactly that connotes it is difficult to express. In occupations where the worker plays as important a part as the machine* there are frequent complaints of, and requests for help for, conditions colloquially described as "nerves" if the emphasis is placed on the person, or "nervy jobs" if a more objective view is taken, or "neurasthenia" if a technical title is desired. It is not uncommon to be told by a worker that he or she has nothing wrong but "nerves" and usually the speaker adds, "And the doctor can't do anything." If enquiry is made as to how the "nerves" show themselves a curious medley of symptoms will be forthcoming. Objectively considered the sufferer will be described as erratic, difficult to get on with, over-fussy about trifles, awkward-tempered, liable to be absent with somewhat vague illnesses. Subjectively he will complain, if opportunity be afforded, of causeless apprehension, inability to concentrate on particular work or at particular times, undue fear of authorities, uncertainty about what he has done (Janet's *sentiment d'incomplétude*), etc. In some people one symptom, touched up by some specific situation, is the chief characteristic, the other reactions being quite normally adapted; in others there are a number of symptoms of varying intensity.

Whatever theories we may hold as to the relation of mind and body (and nobody can work either at physiology or psychology without realising the problem) we have to face the fact that the mind is expressed through the body. But while it is true that a knowledge of the mechanism of the body is extremely desirable yet it is obvious that there are problems which in the present state of our knowledge cannot be attacked by devices primarily concerned with the body.

If one makes a study of symptoms in relation to one another and considers both physical and mental states one finds the following types:—

* There are occupations where the machine is so all-important that the state of mind of the worker is of relatively little moment.

1. Symptoms which appear to expert diagnosis to be mainly concerned with the working of the bodily mechanism. Mental symptoms if present seem to be the attendant circumstances of the disturbed organic state.

2. Symptoms which are directly expressed in mental terms, best illustrated by the obsessions. Usually until a breakdown is imminent the subject says nothing about this aspect, for if he does, the chances are that both doctors and friends think that the remedy is to have a rest, to forget all about it, or to exercise more will-power. The advice is quite useless because impossible.

3. Symptoms which are expressed in bodily and mental form. In the industrial world this is well illustrated by the disability known as telegraphists' cramp. As this has been the subject of a recent research and as it may be characteristic of some other disabilities its investigation will be described in some detail.

It is a disability which primarily affects telegraphists habitually using the Morse or Baudot systems. It manifests itself objectively in an inability to manipulate the telegraphic key, which inability may be complete, i.e., affecting all the movements required for adequate "sending," or partial, i.e., limited to particular letters. The cause has been sought in various objective factors such as the conditions of work, type of keys, as well as in some physiological weakness, but without success[1]. The investigations[2] here reported began by pursuing the usual lines of a scientific enquiry of this kind. A group of telegraphists certified as having cramp and a group of efficient telegraphists were compared from the point of view of success at various tests of neuro muscular ability. Although the results showed that some cramp subjects had considerable muscular disability yet there were a number who showed no disability whatever and who were as efficient at the tests as if they had not had cramp. These tests failed, as had all previous attempts, to find any reliable differentiating factor. The next stage of the research was to study the temperament of the person who had cramp. While it is now possible to test for intelligence with considerable accuracy there is no objective method for the measurement of those qualities roughly known as temperamental. Reliance has, therefore, to be placed on a judgment based on the data obtained at a personal interview.† It is to be noted that as this was research work limitations both as to time and questions asked had to be observed. The interviews usually lasted about twenty minutes, and in that time an attempt was made to get some evidence from the subjects with regard to their attitude to various situations in life, to their work, their relations to their superiors and equals, their doubts and fears. If a subject seemed to be well-balanced, adaptable, and efficient within the limits of his abilities he was for statistical purposes designated as 0. This group comprises a very wide range from any point of view. It is merely the type unlikely to have a nervous breakdown. At one extremity is the brilliant, well-poised successful man, through a wide range, to the rather dull person.

† Dr. Millais Culpin was asked by the Industrial Fatigue Research Board to undertake this.

If he showed symptoms suggesting pathological anxiety,‡ obsessions or hysteria he was marked 2, 3, 4 or 5, according to the severity of the symptoms; between these two groups was a type slightly unstable, approximating at the extreme to the psychoneurotic and to the healthy—this was marked 1. This arrangement was not used in the original cramp investigations, the differentiation then being only into those with severe symptoms and those without. Over 70 per cent. of the cramp subjects have severe psychoneurotic symptoms discoverable under research conditions. It would seem then that this is the predisposing condition. The problem then arose as to the incidence of these symptoms in the general population. So far it has been possible to interview groups of typists, telegraphists, factory workers, clerical workers of all grades, architects and various groups of students. In no group is the incidence as heavy as in the cramp group.

Some of the results are presented in the following Table.

TABLE I.

SHOWING THE DISTRIBUTION OF PSYCHONEUROTIC SYMPTOMS IN DIFFERENT GROUPS. (Figures expressed in percentages.)

		Clerical Workers				Telegraphic Learners	Art Students	Factory Workers
		A	B	C	D	E	F	G
No symptoms	0	60	46	52	49	54	32	43
Slightly psychoneurotic ..	1	19	22	20	21	27	27	25
Severe psychoneurotic symptoms	2+	21	31	28	30	19	41	32

It will be seen that there is considerable difference between some of the groups; it is of interest to notice the similarity of the groups B, C, D, which although under different management are engaged in very similar work. Group A is superior in having a higher percentage of people free from psychoneurotic symptoms than any other group, and a lower percentage of those with severe symptoms.

We know that special circumstances directed the attention of the medical staff to the importance of studying the temperamental qualities of their employees and there has been a definite attempt to exclude people adjudged to be temperamentally unfit, even though their physical, mental and technical qualities were good. The results seem to have been the exclusion of hysterics

‡ Anxiety due to current stress in a particular case has to be allowed for. In practice the distinction is not difficult to make.

and of some anxiety subjects. Such psychoneurotics as were on the staff were of the obsessional type, a type experience shows to be, with some limitations, of considerable efficiency. The telegraphic learners (ages 16) were investigated in order to see if these symptoms could be discovered at this early age. It was found that of these, 19 per cent. had psychoneurotic symptoms sufficiently developed to warrant inclusion in one or other of the recognised groups; 27 per cent. had such symptoms in a mild form, probably of the nature of adolescent nervousness which may pass away with experience, while 54 per cent. seemed to be free from such symptoms. We should expect the future cramp subjects to come from the psychoneurotic group. Records are being kept and their future careers will be noted.

Whether all psychoneurotics will develop cramp cannot be said. It is almost certain that owing to the nature of telegraphy they are more likely to break down in it than at some other occupation. A study is now being made of some of these problems.

Apart from specific disabilities like cramp, "nerves" are expressed in the industrial world, in other ways:—

1. *Much sick leave for complaints diagnosed as headaches, nervous dyspepsia, nervous breakdown, nervous exhaustion, neurasthenia, etc.* The remark is quite frequently made that in spite of rest, change of air, medicine, and in some cases an operation, the sufferer is no better. In one establishment over 51 per cent. of long sick leave was definitely psychoneurotic in character, i.e., some form of so-called nervous breakdown, and this does not include such diagnoses as cardiac debility, gastritis, and allied disorders.

The following Table shows the difference between two establishments of comparable character. The first 10 cases of long sick leave during one year on each list were taken.

TABLE II.

F.C.		H.W.	
Days Lost.	Diagnosis.	Days Lost.	Diagnosis.
48	Cold abscess of thigh.	156	Influenza and pleurisy.
48	Duodenal ulcer.	159	Influenza, influenzal debility, nervous debility, nervous exhaustion.
33	Appendicitis.	124	Nervous debility.
126	Motor accident.	181	Cough, high blood pressure, bronchial catarrh, fibrositis.
42	Influenza.	278	Dyspepsia and nervous debility.
30	Influenza.	109	Cardiac and nervous overstrain.
72	Appendicitis.	92	Debility after appendicitis, influenza and lumbago.
38	Motor accident.	140	Rhinitis.
90	Pulmonary tuberculosis.	243	Pyrexia, hydronephrosis.
108	Pulmonary tuberculosis.	105	General debility.

F.C. refers to the same establishment as Group A in Table I.

Owing to their method of selection this firm (F.C.) has a lower percentage of certain types of neurotic and this is reflected in an absence of the nervous breakdown type of illness. As an example the following case is interesting. Every year for five years the subject has been absent for periods of over 30 days' duration for "debility," "gastritis," "neuralgia," "neuritis," "rheumatism." She happened to be interviewed by Dr. Culpin as a matter of routine for research purposes and was diagnosed by him as having serious psychoneurotic symptoms quite apart from her specific illnesses.

2. *Irritability and difficult behaviour.* Some people confine their nerviness to their social relations. Not infrequently they are physically strong and do not have any sick leave for minor ailments. The complaints, however, are quite common of the difficulty of dealing with people who are abnormally resentful of all criticism, of others who alternate periods of normally reasonable behaviour with periods of irrational antagonism to all around, of others who are disproportionately depressed when things go wrong. Where data can be obtained such people have usually been proved to have anxiety symptoms, although the number investigated so far is too few for statistical purposes. Should such people be in positions of authority (and they often are found there), the unhappiness caused to subordinates is incalculable. These people are more likely to break down in middle age, and, on the basis of no previous sickness absenteeism, the breakdown will be looked upon as a bolt from the blue and attributed to overwork. The real history is not the physical health but the mental stress and difficult adjustments forming the background; nor is it difficult to learn about these symptoms if an opportunity be afforded.

3. Psychoneurotic subjects are also on the average more sensitive to objective conditions to which other people are neutral, e.g., noise, the absence of noise, type of machine; they tend to find less satisfaction in their work, and (excepting the obsessional) to be less efficient than their abilities warrant. Obsessionals are however on the average intellectual and efficient; their mental distress is rarely obvious to the observer: when they do break down their attack is usually severe.

It would certainly be an advantage if the medical profession could diagnose and help at an early stage the sufferers from psychoneurotic troubles. In many cases some insight into the nature of the trouble will bring about improvement; others need prolonged treatment. To dismiss the problems with the magic word "hysteria" is neither honest nor practical and to leave the mental symptoms on one side while emphasising any physical weakness that happens to be present is unfair to the patient and wasteful to the community.

REFERENCES.

[1] *Report of the Departmental Committee on Telegraphists' Cramp*, C.D. 5968.

[2] *A Study of Telegraphists' Cramp*, Industrial Fatigue Research Board Reports, No. 43.

Short Notes and Clinical Cases.

A CASE OF GLIOMA IN THE LUMBOSACRAL REGION.

By G. M. GRAY, London.

The following case is considered worthy of record on account of the rarity of gliomatous tumours in the lumbosacral region.

The patient, J. M., a female child, was born in India, after a normal gestation and confinement, and at the age of three months the first symptom was noticed, viz., acute retention of urine. On examination in hospital, a tumour was palpable in the hypogastric region, and this, pressing on the bladder, had caused the acute retention. These attacks recurred and were relieved by catheterisation. There was also a history of attacks of constipation, the motions being thin and tape-like.

The child was seen in this country at the age of 15 months and was admitted to hospital.

On physical examination she was seen to be of normal weight and size for her age. By combined abdominal and rectal examination under an anæsthetic, a fixed solid tumour, the size of a cricket ball, was palpable in the hypogastric region, arising from the posterior abdominal wall in the region of the promontory of the sacrum. The bladder and rectum were both pushed forward and compressed against the anterior abdominal wall and symphysis pubis.

A skiagram showed a mass in the lumbosacral region with indistinct margins, and there was irregularity of outline of the anterior surface of the fifth lumbar vertebra. The tumour was thought to be of bony origin. With a barium enema the rectum filled well and was pushed over to the left in front of the tumour.

The most likely diagnosis was that of some variety of sacro-coccygeal tumour arising in the region of the neurenteric canal. As the child had been abroad, hydatid disease was thought of as a possibility, as was also some rare form of spina bifida anterior.

Operation, Mr. T. T. Higgins, June 3, 1927.—A mid-line suprapubic incision was made in the Trendelenburg position. The peritoneum was opened and the bladder found pushed forward and downward by a hard, smooth retroperitoneal growth, which seemed fixed to the sacrum. The peritoneum over the tumour was incised and a line of cleavage sought for. This could not be found, and, as there was considerable hæmorrhage, a piece was taken for section and radium (80 mgm.) was inserted for 12 hours.

The wound healed by first intention and the child was sent home.

The patient was seen at intervals afterwards. There was no recurrence of the retention symptoms, but the motions remained "thin and tape-like," though evacuation of the bowels was regular with liquid paraffin.

Fig. 1.—Low power microphotograph of tumour.

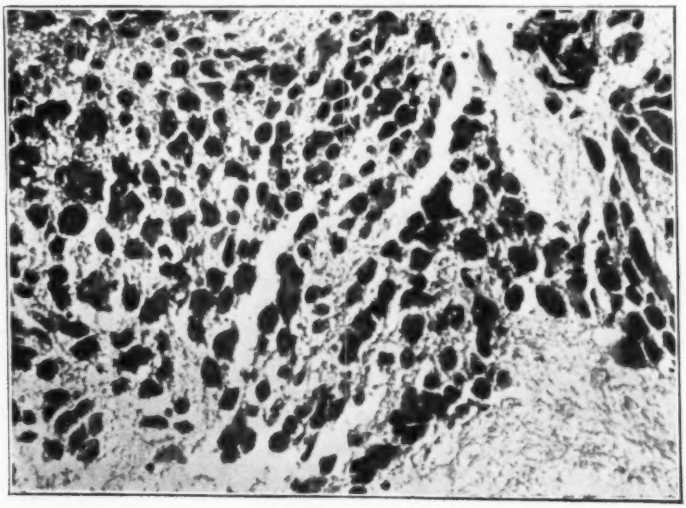

Fig. 2.—High power microphotograph.

As the tumour remained stationary in size, the abdomen was again opened, four months later (October 7, 1927), when the mass seemed very much as before. Another 80 mgm. of radium was inserted for 12 hours.

For the last eight months the child has attended regularly at hospital; she continues to grow normally and is quite healthy. The mass if anything is becoming smaller.

Microphotographs of the tumour are appended (See Figs. 1 and 2), and although the diagnosis is now glioma, opinions differ slightly over the sections. It has been considered:

(1) A myelocele. It contains much nervous tissue with large cells, which look like nerve cells, but seem rather undifferentiated.

(2) Glio-neuroma.

(3) A glioma, probably teratomatous, or from the neurenteric canal.

(4) Gliomatous tissue.

I am indebted to Mr. Twistington Higgins for permission to publish this case, to Dr. Nabarro for much help in obtaining opinions on the sections, and also to Dr. J. G. Greenfield for the microphotographs and for his views, which are expressed under (1) above.

Editorial.

PAST AND PRESENT.

THE life of any branch of science is continuous although its form may change; yet it is remarkable that in few branches of medicine has progress been steadily continuous and knowledge accumulated step by step. Rather has the science evolved in a series of waves with intermissions and often phases of actual retrogression. To this observation neurology furnishes no exception. Clinical and therapeutic facts of far-reaching significance have been recorded, only to be lost sight of until rediscovered at a much later period. Even at the present day, how often will an apparently new observation, an unfamiliar symptom or physical sign be found, on close examination of the literature, to be well-known and fully described by earlier writers?

What of the past? Many neolithic skulls have been discovered with artificial openings indicating that the operation of trephining was practised in prehistoric times. It is true that Broca considered that the perforations in such skulls might have a ritual or religious significance, but Horsley and Lucas Champonnière were definitely of the opinion that they represented trephine openings performed for therapeutic purposes. Horsley, indeed, pointed out that the opening was nearly always over the Rolandic area of the cortex. Evidence of survival for a long period following the operation is in many instances quite distinct. Trephining was also of common occurrence in the time of Hippocrates (300 B.C.) and was apparently continued by Galen (150 A.D.). For many centuries following this, medical science appears to have been at a standstill, but trephining is again mentioned by Guy de Chauliac in 1363 and subsequently by sixteenth century writers. Following Galen, however, little advance was made either in the application or the technique of the operation until comparatively modern times.

It is said that the thyroid gland of the sheep was well known to the ancient Chinese as a remedy for mental deficiency—presumably cretinism—and certain forms of goitre; and it is mentioned in a Chinese medical classic—the "Thousand Gold

Remedies "—published in the sixth century. Yet only within living memory has thyroid-substance appeared in recognised therapeutics; its application to cretinism and myxœdema is a triumph of experimental medicine for which we are indebted to Victor Horsley and his pupil Murray.

The significance of certain neurological symptoms was also known to the ancient physicians. Hippocrates recognised that an injury to one side of the head might be followed by convulsions or paralysis of the opposite side, while Celsus (30 B.C.) was well aware that subdural hæmorrhage could produce diminished visual acuity. The site of some of the lesions resulting in paralysis must have been familiar to Galen, who, in animals, had divided the spinal cord at different levels and removed portions of the brain. Then follows the long period of darkness extending almost to the sixteenth century, when little of scientific value was added to neurology and much was forgotten.

In the following century, however, the work of the famous Andreas Vesalius (1514-1564) was to illuminate all branches of medicine. As regards neurology he writes: "So also does the brain manufacture the animal spirit—on the one hand it employs this spirit for the operation of the chief soul, and on the other hand it distributes it to the instruments of the senses and of movement by means of nerves—which serve the same purpose to the brain as the great artery does to the heart and the vena cava to the liver." Yet it is obvious that Vesalius took a strictly physiological view of the origin of the "chief soul" and that he considered it as engendered in the brain by "virtue of the power of the proper material and form of the brain," or, as we might say in more modern form, "psychical phenomena result from the activity of nervous tissues." Following Vesalius, Massa in 1536 describes a case of cerebral abscess causing contralateral paralysis, and Valsalva in the seventeenth century reaffirms the fact that motor palsy resulting from a brain lesion is on the opposite side of the body. Larrey (1766-1842) describes a case of Jacksonian epilepsy cured by operation, but not until nearly a century later does that great neurologist Hughlings Jackson definitely establish the form of epilepsy that bears his name. In 1873, David Ferrier rediscovers the science of experimental neurology, apparently lost since Galen, and by means of his brilliant observations places on a firm and lasting basis the principles of cerebral localisation. With Hughlings Jackson, Charcot, Ferrier and Quincke, the golden era of neurology may be said to have begun.

What of the trend of more recent neurological observations ? It is now the age of the extrapyramidal system. About 1885, Gowers had noted certain cases exhibiting general muscular rigidity with involuntary movements which usually occurred in more than one member of a family. Sir David Ferrier mentioned these cases as exhibiting something between disseminated sclerosis and paralysis agitans. It was left for Kinnier Wilson, in 1912, to describe the lesion of progressive lenticular degeneration with hepatic cirrhosis and establish on a firm clinical and pathological basis the disease known by his name. Of paralysis agitans, Gowers writes in 1888 that in the absence of any anatomical evidence, the pathology has been the subject of much speculation, and he advances reasons for regarding the cortical cells as the seat of the disease. In spite of this suggestion as to its organic origin, scarcely twenty years have passed since paralysis agitans was regarded as amenable to treatment by hypnotism. The reproduction of the same symptom-complex by encephalitis lethargica, with its associated histological changes in the midbrain, has finally dispelled any doubts regarding the fundamental organic nature of the former disease. In encephalitis lethargica itself have we indeed a disease dating only from 1917, or at longest from the Tübingen epidemic of 1912 ? Was Dubini's electric chorea, described in 1846, the myoclonic form of the affection ? It is to be remembered that cases of " paralysis agitans " occurring at ages of 17 (Berger), 19 (Duchenne) and 21 (Buzzard) and up to 30 years were described in the latter part of the nineteenth century. Pathological observations in epidemic encephalitis, moreover, have suggested an organic basis for other forms of tremor, myoclonus and hyperkinesis previously regarded as " functional " ; but the actual mechanism still escapes us. Of Sydenham's chorea, now virtually recognised as a form of meningo-encephalitis, Osler writes as recently as 1909 : " the most generally accepted view is that it is a functional brain disorder affecting the nerve centres controlling the motor apparatus, an instability of the nerve cells." Narcolepsy is now a well-recognised condition, though more probably a symptom-complex than a definite clinical entity. Originally described by Gélineau as long ago as 1880 and again fully dealt with by Gowers in 1907, this interesting condition remained almost forgotten until recent years. The disorders of behaviour following epidemic encephalitis show a tendency to be reduced to an organic basis and the thalamus is cited as the structure at fault. It is noteworthy that such behaviour disorders

may be associated with symptoms usually ascribed to disordered function of the pituitary body; at the same time, cases have been recorded showing moral delinquency with undoubted dyspituitarism quite apart from any suggestion of encephalitis. Is a disturbance of the hypothalamus as well as of the thalamus responsible for both types of case? The physiology of the pituitary body itself is in the melting-pot, and how many of the functions previously attributed to this gland are, in reality, carried on by hypothalamic centres remains uncertain.

Much valuable work has been done regarding the anatomical basis of the more obscure examples of nervous disease; nevertheless, essential causes still escape us. The exact nature of epilepsy remains as obscure as in the days of Julius Cæsar, and "idiopathic" still means that we do not really know. The alleged spirochæte of disseminated sclerosis has not yet emerged; and progressive muscular atrophy, although it has acquired a new name (motor neurone degeneration), is still a premature decay. In other branches of medicine the modern tendency is towards ascertaining the exact functional capacity of the living organ rather than towards concentrating on its morbid anatomy; numerous biochemical tests of functional activity have appeared during recent years. Is it too much to hope that similar tests of nervous function will eventually evolve? Shall we live to see the phobia, the obsession and the delusion reduced to a biochemical reaction? Many consider that the psychoses will be explained by metabolic dyscrasias or ultramicroscopic changes as yet obscure. Professor Weygandt in his opening paper at the last British Medical Association meeting (Section of Neurology and Psychological Medicine) gave an admirable summary of the abnormalities of metabolism that may be met with in mental disorders. By no means is it suggested that psychopathology is without importance. Symptomatology, psychological investigation, physical examination, biochemistry and morbid anatomy are but lines of research all converging upon the same point—the elucidation of the ultimate causes and the adequate treatment of nervous disease.

Abstracts.

Neurology.

NEURO-ANATOMY AND NEUROPHYSIOLOGY.

[83] **Some observations on the innervation of skeletal muscle in the cat.**—J. C. Hinsey. *Jour. Comp. Neurol.*, 1927, xliv, 87.

This is a record of a carefully planned anatomical research into the question of the innervation of skeletal muscle, with separation of the three components, motor, sensory, and sympathetic respectively. The value of the paper is increased by its highly useful summary of the work of other histologists. Since much depends for theories of muscle tonus on the anatomical constituents of skeletal muscle an investigation of this kind is significant.

Each component was isolated by degeneration, and studied in pyridine-silver preparations of the degenerated muscles.

1. In regard to the ventral root component of the quadriceps, the motor end-plates are supplied by myelinated fibres in most instances. Some have been seen, however, which have been supplied by unmyelinated motor fibres. Somatic motor innervation to the intrafusal muscle fibres has been observed.

2. As for the dorsal root component of the same muscle, both myelinated and unmyelinated sensory fibres have been seen in the nerve to the muscle. The receptors of muscle have been observed—muscle spindles, tendon spindles, paccinian corpuscles, and endings of small myelinated and unmyelinated fibres.

3. The sympathetic component was examined in the small muscle of the hind foot of the cat. Unmyelinated sympathetic fibres and endings have been seen in vascular plexuses. No unmyelinated sympathetic fibres have been discovered ending hypolemmally in the small muscles of the foot. A careful study of his material leads the author to state that it would be quite possible to mistake various types of normal and regenerating somatic fibres for sympathetic nerve fibres.

Thus, after a thorough investigation the author reports a negative finding for the alleged sympathetic component, and in this respect his results contradict those of Boeke and others and are in accord with those of Cajal, Woolard, and others.

J. V.

NEUROPATHOLOGY.

[84] **Alterations in the central nervous system in fatigue** (Alterazioni del sistema nervoso centrale nella fatica).—V. Tronconi. *Riv. di pat. nerv. e ment.*, 1927, xxxii, 33.

In one or other part of the central nervous system of fatigued animals the following changes may be seen.

With Nissl's method in the large cells of the spinal ganglia a chromatolysis of the tigroid zone can be demonstrated. The nuclei are altered, and have irregular outlines. There are no obvious changes in the anterior horns of the spinal medulla, or in the cerebral cortex. Similar changes are noted by Perl's method with organic iron. There is no alteration in the morphological structure of the endocellular neurofibrils of the cortical cells. Golgi's reticulum is not definitely affected by serious fatigue. The mitochondria, studied by the method of Meres and Renaud, are diminished in number, size, and perhaps power of colouration. Microscopical examination reveals a diminution of the lipoid in the large ganglion cells and in those of the spinal medulla.

R. G. G.

[85] **The causation and pathogenesis of disseminated sclerosis** (Contributo alla etiopatogenesi della sclerosi multipla).—G. Jervis. *Il Cervello*, 1928, vii, 53.

Dr. Jervis has made a large number of experimental inoculations in rabbits with material derived from cases of disseminated sclerosis. He injected cerebrospinal fluid endocerebrally, at the same time inoculating them with disseminated blood intraperitoneally, intravenously and subcutaneously. Many laboratory animals were subjected to a second complex inoculation of this kind with similar material. Careful controls were conducted. Five rabbits died eventually after inoculation, but in no case could death be ascribed to communicated disease.

All examinations both of human material and of experimental animal tissues, by approved modern methods, failed to reveal in a single instance any evidence of the existence of a spirochæte.

His results therefore must be added to those of others whose researches along identical or similar lines have been negative. The paper is important, and its value is increased by the useful summaries of previous investigations.

S. A. K. W.

[86] **Contribution to the pathological histology of the neuroglia** (Contributo all' istologia patologica della nevroglia).—G. B. Belloni. *Riv. di pat. nerv. e ment.*, 1928, xxxii, 324.

In mental syndromes in which death is preceded by a confusional state, with or without hyperpyrexia, a regressive alteration in neuroglial plexuses and glial cells is found distributed throughout the nervous system. These alterations, which show the characteristics of an autolysis, are more marked in the

protoplasmic glia than in the fibrillar tissue. The astrocytes of the white matter are apt to give rise to amoeboid cells. The glial cells which are transformed into fibrillar tissue under the stimulus of chronic disease are particularly resistant to autolysis.

R. G. G.

[87] **New researches on impregnation of the nervous system with silver, particularly of the neuroglia and microglia** (Nuove ricerche sulla impregnazione argentea del tessuto nervoso e particolarmente della nevroglia e microglia).—D. Bolsi. *Riv. di pat. nerv. e ment.*, 1927, xxxii, 51, 898, 907.

This is a description of a special laboratory technique for the demonstration of the neuroglia and microglia elaborated by the author. It is not capable of abstraction, but the complicated process is described in full detail in the text.

In a later paper he describes a further elaboration of his method and demonstrates that the microglia of different animals shows varying intensities of staining and colour reactions with his method.

In a third paper (illustrated by microphotographs) he shows how in the process of repair of wounds, cauterization, and acute inflammation of the brain microglia is converted into fatty granular bodies which have already been credited with defensive functions. Phagocytosis and the elaboration of the products of disintegration in the transitional forms are described in detail.

R. G. G.

[88] **On the content in the cerebrospinal fluid of the products of division of the albuminoid molecule** (Sul contenuto nel liquor dei prodotti di scissione della molecola albuminoidea).—A. Massazza. *Riv. di pat. nerv. e ment.*, 1927, xxxii, 1.

From biochemical experiments on 25 fluids from neurological cases the following facts emerge. The free amine-acids in the fluids are increased in all morbid conditions which show increase of albumin, but the figure is not proportionate to that of the hyperalbuminosis. The increase in amino-acids is moderate in cerebral syphilis, and more obvious in meningeal lesions and in other syndromes exhibiting a meningitic colloidal curve; it seems in all cases in direct correspondence with the intensity of the leucocytosis and with the type of meningitic curve of colloidal precipitation. In normal fluids the figure for amino-acids varies from 1·50 to 1·90 mgm., and in lesions of the neuraxis with hyperalbuminosis from 2 to 4·50 mgm.

As for the amino-acids contained in the total proteins of the various types of fluid tyrosin, identified by Millon's reaction, shows itself proportionate to the total quantity of albumin. Tryptophane, the aromatic group, and the hydrocarbons of the protein molecule show themselves to a certain extent in

proportion to the total albumin content, but are more definitely demonstrable in meningeal lesions. The increased proportion of the amino-acids, more particularly of certain groups, is of diagnostic significance in meningeal cases.

Similar methods show that inorganic phosphorus ranges from 1·6 to 2·2 mgm. per cent. in normal fluids, is slightly increased in syphilis, and reaches 3 mgm. per cent. in meningeal lesions. Sodium (225 mgm. per cent.), potassium (9 to 16 mgm. per cent.), calcium (2 to 5 mgm. per cent.), and magnesium (·50 to 2·50 mgm. per cent.), do not vary to any extent in various morbid conditions.

R. G. G.

[89] **The Kahn test on spinal fluid.**—T. G. Hull, L. Fry and C. Garwood. *Amer. Jour. of Syphilis*, 1928, xii, 104.

In the Illinois State Department of Public Health the Kahn test has replaced the Wassermann reaction. Consequently the authors were unable to test the sensitiveness and specificity of the Kahn (globulin concentration) test for the cerebrospinal fluid with the Wassermann reaction as had previously been done by Kahn on 1,000 specimens. In this paper, which is based on the examination of 1,200 specimens of spinal fluid, the specificity of the test was estimated from the clinical history and the relationship to other spinal fluid tests. On the whole fairly good correlation was found with the clinical history. Of 181 specimens of fluid from patients diagnosed as syphilitic, 122 gave positive reactions, 13 partial reactions and 46 negative reactions. Of the last group 32 were from treated patients, and in these corroboration was obtained from the other spinal fluid tests in all except eight specimens from general paralytics, in which the globulin colloidal gold tests remained positive. Of 229 specimens from patients diagnosed as non-syphilitic 222 gave negative Kahn tests. Of the remaining seven fluids four gave positive colloidal gold and globulin tests, which corroborated the Kahn result. In the other three such corroboration was wanting.

This report bears out the specificity of the test, but the non-correspondence of Kahn and Lange tests in the eight general paralytic cases suggests that it is less delicate than the Wassermann reaction.

J. G. G.

[90] **New data on the toxic origin of chronic postencephalitic syndromes** (Nuovi dati sulla genesi tossica delle sindromi croniche postencefalitice).—V. M. Buscaino. *Riv. di pat. nerv. e ment.*, 1928, xxxii, 880.

The author has found lesions (ulcers) of the gastric and duodenal mucosa accompanying midbrain and basal ganglionic lesions, and adduces evidence to support the theory that chronic syndromes following encephalitis are due to a toxæmia of gastrointestinal origin.

R. G. G.

SENSORIMOTOR NEUROLOGY.

[91] **Primary birolandic lobar encephalosclerosis, with syndrome mainly extrapyramidal** (Encefalosclerosis lobar bi-rolándica primitiva; sindromo extrapiramidal predominante).—C. JAKOB and J. MONTANARO. *Revista Oto-neuro-oftalm.*, 1928, ii, 224.

IN this curious case, that of a young man of 29, the symptoms began gradually with indications of a non-pyramidal change in the shape of intention tremor, hypermetria, asynergia, adiadochokinesia and dysarthria; later appeared spastic symptoms amounting in the end to pronounced rigidity, yet without pyramidal symptoms in the strict sense. Walking became impossible, and there was notable dyspraxia of the upper limbs. Intelligence, at first normal, rather deteriorated during the later years of the affection. The dysarthria in the end became an anarthria.

Anatomically a symmetrical cortico-subcortical sclerosis of both rolandic areas and of the "immediately neighbouring" zones was found, involving both fibres and cells especially of the outer pyramidal layer of the cortex, but without obvious degeneration of the pyramidal tracts. An atrophy of the corpus callosum was found related to the rolandic degeneration. The corpus striatum, cerebellum and medulla were normal.

No evidence of any inflammatory change could be discovered; the lesions were purely degenerative. The vessels showed no obvious pathological alteration. An interesting attempt is made to explain the clinical symptoms by involvement of afferent paths from cerebellum and elsewhere at their cortical terminations in the central gyri, and the altered dynamism of striato-subthalamic systems by diaschisis.

There is seemingly no reference to the condition of the liver, clinically or pathologically.

S. A. K. W.

[92] **Syndromes of the prefrontal lobes** (Sindromes de los lóbulos pre-frontales: consideraciones clinico-quirúrgicas).—E. DOWLING and R. ORLANDO *Revista Oto-neuro-oftalm.*, 1928, ii, 109.

THREE cases of lesion of the prefrontal lobes are presented, one of tumour, one of abscess, and one of traumatism. From the neurological standpoint, stress is laid on anosmia and on weakness of the opposite side of the face, as being of localising value. More significant are changes in higher psychical functions, described here as alteration in personality, absence of initiative, indifference and moria. Mention is also made of the spatial disorientation noted by Pierre Marie, and named 'planotopokinesia' by Boutier and Bailey, which was observed in one of the three cases.

S. A. K. W.

[93] **The diagnosis of cysticercus of the brain during life** (Diagnosi in vita di cisticercosi cerebrale).—C. Rizzo. *Riv. di pat. nerv. e ment.*, 1928, xxxii, 952.

A case is described of a man who suffered from convulsive attacks from the ages of 20 to 51. During the last four years he exhibited mental enfeeblement and characteristic disturbances of motility. The Wassermann reaction in the cerebrospinal fluid was constantly negative but the colloidal curves were characteristic of cerebrospinal syphilis. This shows that the agency which determines colloidal precipitation is different from that causing deviation of complement. The diagnosis of cysticercus was established by the presence of eosinophils in the cerebrospinal fluid. It may be said that in cases of convulsions accompanied by organic nervous lesions and mental enfeeblement cysticercus should be suspected, that the absence of lymphocytosis in the cerebrospinal fluid excludes this condition, while the presence of eosinophils in the fluid confirms it.

R. G. G.

[94] **Tumours of the posterior cranial fossa.**—E. M. Gould. *Arch. of Neurol. and Psychiat.*, 1928, xix, 509.

In unilateral expanding lesions above the tentorium, increase in the tendon reflexes is usually greater on the side of the body opposite to that of the lesion. On the other hand, in infratentorial new growths, there are many variations in the tendon reflexes on the two sides; in some instances, the reflexes are unchanged; in others, all tendon reflexes are diminished; in some patients there is a bilateral and equal increase; in others, there is a homolateral or contralateral hyperreflexia. With a view to studying the variations in this latter group the author reviewed the clinical histories in fifty cases of unilateral tumour of the posterior fossa.

Seventy-four per cent. had more marked signs of pyramidal tract involvement on one side of the body. In 73 per cent. (or 54 per cent. of all of the cases) of the cases in which there were relatively unilateral changes there was a relative increase in tendon reflexes on the same side as the expanding lesion. In twenty-four patients, the neoplasm was in the cerebellopontine angle, and in 79 per cent. of these the reflexes were more active on one side of the body; in 84 per cent. the hyperreflexia was greater on the same side as the lesion. In twenty-six patients the tumour was within the substance of one cerebellar lobe, and in 69 per cent. of these the reflexes were more active on one side of the body. In 61 per cent. of these patients the hyperreflexia was greater on the same side as the lesion. The conclusion is reached that in obscure intracranial expanding disease, especially when there is a question whether the growth is supratentorial or infratentorial, the changes in the tendon reflexes on the two sides of the body may assume considerable importance. This is especially true when there is a difference between the disturbances of the pyramidal

tract on the two sides, for a relative increase in tendon reflexes on one side may and often does occur with infratentorial tumours of the same side. Furthermore, because homolateral increase in tendon reflexes is considerably more frequent in lateral recess than in infracerebellar growths, the occurrence of a relative hyperreflexia on the same side as the cranial nerve and cerebellar disturbances may be of aid in the differentiation between extracerebellar and intracerebellar disease. R. M. S.

[95] **The ventricular system: its relation to the cerebellum. Ventriculography and other ventricular evidence in the recognition of cerebellar disease.**—C. A. Elsberg and S. Silbert. *Arch. of Neurol. and Psychiat.*, 1928, xix, 596.

In a large number of instances of cerebellar disease, the symptoms and signs of a lesion in the posterior cranial fossa are so well marked that studies of the ventricles are unnecessary, but when the diagnosis of the location and of the nature of a disease are uncertain the information to be obtained from studies of the ventricles is of no little value. The evidence obtained by ventriculography and by the injection of dyes is not always unequivocal, for tumours in one or other location may cause pressure on more than one part of the pathways of the cerebrospinal fluid, and other parts of the ventricular system may be compressed by the dilated ventricles themselves.

Important questions which often arise are: (1) Is the disease in or around the cerebellum and vermis and, if so, is it a tumour? (2) Is the tumour located in one frontal lobe or in the cerebellar lobe of the opposite side? (3) Is the growth one in the posterior cranial fossa which has caused an obstructive hydrocephalus from pressure on the iter or the fourth ventricle, or is it supratentorial, with dilated ventricles because of pressure on the third ventricle?

1. If progressive signs and symptoms point to a cerebellar lesion, the presence of dilated ventricles determined by puncture on one or both posterior horns make the presence of an expanding lesion probable. If, in addition, examination of the urine after injection of phenolphthalein into a lateral ventricle fails to show a large amount of the dye in the urine within two hours, the diagnosis of an expanding lesion in the posterior cranial fossa is so well grounded that injections of air and ventriculography are unnecessary. The absence of bilateral ventricular dilation does not entirely exclude an expanding lesion in the posterior cranial fossa, although it makes it improbable and the likelihood of non-expanding intrinsic cerebellar disease greater. If, however, ventriculography has been performed, the occurrence of dilated ventricles with a regular outline gives support to the diagnosis of a lesion of the posterior fossa. The contralateral ventricle is usually the larger one, and the posterior horn of the lateral ventricle on the same side as the tumour is often dislocated forward, outward and upward.

2. When the diagnosis rests between a tumour of one frontal lobe or of the opposite cerebellar lobe, and puncture of the ventricle on the side of the possible frontal lesion discloses a dilated ventricle, the growth is, in all probability, in the posterior cranial fossa. If, in addition, the other lateral ventricle is punctured and is found to be also dilated and indigo carmine or other dye passes from one into the other lateral ventricle, the probability is made a certainty, and injections of air are not necessary.

3. If the clinical diagnosis favours the presence of a supratentorial growth which is compressing the third ventricle but if a cerebellar neoplasm cannot be excluded, and puncture of the lateral ventricle on the side on which the tumour is presumed to be shows that the ventricle is dilated, a subtentorial lesion cannot be excluded until air has been injected and the ventriculograms studied.

Tumours which cause bilateral dilatation of the ventricles from compression of any part of the third ventricle usually cause some defect in the regular outline of the ventricles as seen in anteroposterior radiograms. If the ventriculograms show that the third ventricle is dilated, then the obstruction must be either in the hindmost part of the third ventricle or behind it, and the probability of a lesion of the posterior fossa becomes greater.

That there is a certain amount of danger from the injection of air by ventricular puncture is without question, and it would be a great advantage if in lesions of the posterior fossa the air could with safety be injected by the lumbar route.

Ventricular estimation should always be performed first ; that is, a puncture of one or both lateral ventricles through their occipital horns in order to determine whether both ventricles are dilated and the foramina of Monro are patent. In the majority of cerebellar tumours, ventricular puncture alone, or ventricular estimation with studies by means of the injection of dyes will suffice, and injections of air and ventriculography should be performed only when the clinical and ventricular evidence of a cerebellar new growth is inconclusive.

R. M. S.

[96] **Cerebellar tumours occurring in identical twins.**—F. H. LEAVITT. *Arch. of Neurol. and Psychiat.*, 1928, xix, 617.

LEAVITT records the clinical histories of two children of the monozygotic type. Both were remarkably similar in mental, physical and emotional characteristics. In each case death was due to cerebellar tumour, but a necropsy could only be obtained on the first. The tumour was found in the vermis of the cerebellum, and apparently arose from the region of the roof of the fourth ventricle. Histologically it showed the typical structure of medulloblastoma. There can be little doubt that the twins had cerebellar neoplasms in similar situations, and, as the structure of the tumour examined was composed of embryonic cells,

and as it is believed that monozygotic twins develop as a result of the splitting of a single fertilised ovum the writer concludes that both tumours were due to a 'foetal rest' of embryonic tissue remaining as a pathological nidus in the roof of the fourth ventricle of each twin. R. M. S.

[97] **Syndrome of excitation of architectonic field No. 19 of Brodmann** (Irritatives Syndrom des architektonischen Feldes '19' Brodmann). —E. WENDEROWIC. *Archiv f. Psychiat.*, 1928, lxxxiv, 759.

A YOUNG girl of 13 suffered for about three years from peculiar fits, largely Jacksonian, of the following character. (1) Tonic contraction of appropriate muscles deviated the eyes conjugately to the right, and after a brief period this passed into clonic twitches, fine at first but soon becoming coarser and slower; (2) when the twitching ceased the eyes for a short time deviated to the side of the lesion. (3) The palpebral aperture on both sides contracted down in a tonic spasm, occasionally interrupted during the attack by blinking movements. (4) The pupil narrowed down on both sides. (5) The head tended to deviate backwards. (6) As the attack passed off, visual hallucinations appeared and were referred by the patient to the right side of the field. They consisted sometimes of rather elaborate presentations of simple objects (buildings, an open coffin, cats, horses, streams, a moving sea, etc.); usually white, they were occasionally coloured red, brown, bright blue, etc., or were multicoloured. At other times elementary visual types appeared—photomata in the form of white light, taking the shape of stalactites, etc.

On objective examination, however, no evidence was forthcoming of rise of intracranial pressure. The bronchial glands were tuberculous.

An interesting discussion leads the author to ascribe the syndrome to excitation of the vicinity of the angular gyrus, and to substantiate the old experimental observations of Ferrier.

S. A. K. W.

[98] **Tumours of the corpus callosum** (Contributo allo studio dei tumori del corpo calloso).—V. BEDUSCHI. *Il Cervello*, 1928, vii, 109.

THE case is that of a woman of 51, who for more than ten years suffered from Jacksonian fits localised in the lower part of the face on the right side and in the right arm, rarely spreading to the leg; she also exhibited psychical changes, such as amnesia and unmotivated mirthfulness. Eventually a right hemiplegia supervened, and a fortnight later motor aphasia.

A gliomatous tumour, with cystic degeneration, was found in the left side of the corpus callosum, spreading on the mesial aspect of the left frontal lobe.

It is apparent that the case presents difficulties in respect of harmony between the clinical symptoms and the pathological findings. The author

evidently accepts the possibility of right hemiplegia and motor aphasia being caused by callosal and frontal lesions; he also stresses the point that the Jacksonian epilepsy must have been extrarolandic—a question raised as long ago as 1903 by Dieulafoy, but never properly examined.

S. A. K. W.

[99] **Obstruction of the longitudinal sinus.**—J. B. Doyle. *Arch. of Neurol and Psychiat.*, 1927, xviii, 374.

In the absence of meningitis, the early onset of apathy or stupor in a patient with evidence of thrombosis of the transverse sinus secondary to suppurative otitis media generally indicates infectious thrombosis of the superior longitudinal sinus by retrograde extension, especially if associated with choked discs and convulsions. When the probable presence of tumour or inflammatory disease can be excluded, Jacksonian seizures, showing progression from one foot to the other, or beginning in the foot and gradually involving the homolateral upper extremity, suggest impairment of the circulation of the cerebral veins and probable thrombosis of the superior longitudinal sinus. Abrupt onset of symptoms of increased intracranial pressure, which follow a fluctuating course, should bring in mind the possibility of thrombosis of the superior longitudinal sinus as well as ventricular tumour. The absence of the element of progression after a fair length of time, or actual regression of symptoms, is suggestive of thrombosis of the superior longitudinal sinus. If the syndrome is associated with œdema of the eyelids and dilatation of the veins of the eyelids and forehead, and if fracture of the skull, orbital and periorbital infections and thrombosis of the cavernous sinuses can be excluded, the diagnosis is established.

R. M. S.

[100] **The topography of disorders of sensibility on the trunk in cases of cerebral hemianaesthesia** (Zur Topographie der Sensibilitatsstorüngen am Rumpfe bei der zerebralen Hemianästhesie).—Emil Redlich. *Monats. f. Psychiat. u. Neurol.*, 1928, lxviii, 453.

A series of cases are described in which lesions presumed to be cerebral for other reasons, definite enough, were associated with changes in sensibility over the trunk of various interesting kinds. Among these may be mentioned the following. The author has found that in some instances the defect crosses the middle line in front. He has also seen cases with a segmental loss corresponding to what is regularly found in spinal cases. Especially noteworthy is his claim that in some instances the sensory modification is much more marked anteriorly on the trunk than posteriorly; he has not noted the reverse of this. It so happens that in only one of his reported cases was pathological confirmation forthcoming, and this was unfortunately a complicated one; a cerebral tumour was present, but also a syringomyelic defect in the upper cervical cord.

Useful references from the literature are selected, however, which appear to show that (1) in unilateral cerebral cases the sensory defect may cross the midline of the trunk, and (2) differences as between the front and back of the trunk may on occasion be found.

S. A. K. W.

[101] **Hereditary optic atrophy.**—G. H. Hogg. *Med. Jour. Austral.*, 1928, xv, 372.

Hogg describes a family affected with Leber's disease, and gives a comprehensive pedigree extending over eight generations. His cases showed the usual clinical picture—failure of vision coming on in both eyes almost simultaneously and rapidly falling to about 6/60, occurring in young patients with a family history. Vision usually remains at this level but may improve a little. The optic discs may show slight congestion in the early stages which is succeeded by atrophy unaccompanied by diminution in the calibre of the blood vessels.

He finds that the age incidence is usually about 20, and that the families with an early onset generally show more affected females. In his family only one male was affected to every three females, descent took place through the female line, and no male having the disease transmitted it to his offspring. He discounts the recorded occurrence of mental symptoms in this condition.

He considers that the atrophy follows on a retrobulbar neuritis of unknown origin, but his cases showed no X-ray evidence of sellar changes such as were found by Fisher.

P. W.

[102] **The oculo-auricular associated movement.**—R. M. Brickner. *Arch. of Neurol. and Psychiat.*, 1928, xix, 104.

In a paper published in 1908, S. A. K. Wilson showed that when the eyes are deviated extremely to one side or the other there is a slow contraction of one of the intrinsic muscles of the ear, the musculus transversus auris. This small muscle, situated on the posterior aspect of the concha, spanning the fossa antihelicis, and connecting the helix and antihelix, draws the pinna posteriorly. The muscle fibres are innervated by the seventh cranial nerve.

The phenomenon is usually termed an 'associated movement' but Brickner finds that the oculo-aural response is present in cases of paralysis, a finding which he considers militates against the acceptance of that view. He also noted a striking diminution in the range of the movement in the presence of weakness of the facial nerve of even slight degree. The test may, therefore, be of some value in determining the presence or absence of lesions of the facial nerve in doubtful cases.

R. M. S.

[103] **Unilateral (unassociated) innervation of the ocular muscles.**—W. G. SPILLER. *Arch. of Neurol. and Psychiat.*, 1927, xviii, 691.

THE case studied and reported in this paper was one in which normal associated lateral ocular movements were present, but, in addition, the patient had the power of maintaining fixation of either eye on an object directly in front of him while he slowly rotated the other eye widely outward and brought it back on command. He also had almost complete absence of convergence and no binocular vision.

The separate voluntary movement of the eyeballs was probably congenital, while a former attack of epidemic encephalitis explained the absence of convergence.

The author considers this phenomenon to be a partial reversion to a primitive type. It could not be explained as the result of equal innervation of the two eyes or mere relaxation of the internal rectus, and since the voluntary outward movement was decidedly greater than the divergence in the position of rest, it could not be due to a "drifting-out" of the eye to the normal position of rest as a result of strabismus divergens.

R. M. S.

[104] **On oblique and inverted vision** (Über Schief und Verkehrtsehen).—JOSEF WILDER. *Deut. Zeits. f. Nervenheilk.*, 1928, civ, 222.

THIS is a very interesting paper, dealing with a difficult subject. For practical purposes a distinction is drawn between apparent tilting or obliquity of a seen object, turning of the same through a right angle ("on its side"), and complete inversion to an upside-down position. Five organic and five functional cases are chosen and studied. For the details the original must be consulted, but the following tentative conclusions may be outlined.

Upside-down vision seems to depend on a high-level cerebral disorder of visual orientation, although concomitant disturbance of the peripheral (automatic) orientation apparatus would appear to be a conditio sine qua non.

Apparent rotation through a right angle (the seen object being on its side) has been described, but not with sufficient detail. It also seems to be caused by central dysfunction on a high level. The author reports one case in which only peripheral disorder could be detected.

As for oblique vision, it may occur in a lasting form under the same conditions as inverted vision, though it is mainly the peripheral apparatus which is involved; or it may be latent, under both pathological and physiological circumstances. Excitation of the peripheral orientation mechanisms will cause it to appear temporarily; as will, in particular, cerebral attacks of angioparalytic type.

Monocular obliquity of vision is usually peripheral but may be central; pure binocular obliquity is peripheral.

S. A. K. W.

[105] **Binasal hemianopia** (Über binasale Hemianopsie ; eine vergleichende Zusammenstellung von 84 Mitteilungen in der Literatur, etc.).—Anton Lutz. *Arch. f. Opthalmol.*, 1928, cxix, 423.

Binasal hemianopia is a relative rarity, affecting males much more than females and being noticed most frequently in the third and fourth decades. It may be a residue from complete blindness or may pass into the latter. Binasal hemiamblyopia and binasal hemiachromatopsia have been observed. Central vision is usually seriously involved ; a central scotoma may be found. The condition never begins with binasal scotomata, and never appears suddenly and simultaneously in both eyes ; one eye involvement always precedes the other. It is remarkable, too, in that accompanying clinical symptoms are commonly meagre or slight in the extreme. It may be associated with binasal hemiakinesis pupillaris, and with optic neuritis or atrophy, or normal discs.

Its most frequent cause is cerebral tumour, especially of subtentorial site, stagnation of fluid in the third ventricle leading to bulging of its floor and to pressure on the optic nerves from the neighbouring vessels of the circle of Willis. Arteriosclerotic changes in the circle, syphilis and trauma, and also aneurisms, are in other instances responsible. S. A. K. W.

[106] **The affections of the optic nerve in epidemic encephalitis** (Les affections du nerf optique dans l'encéphalite epidémique).—K. Winther. *Acta Psychiat. et Neurol.*, 1928, iii, 165.

In this paper ' papillary stasis ' is used to signify a mushroom-like condition of the optic disc, with a measurement of two dioptres or more. Vision is commonly prolonged for some time, though transient dimness may occur. The field of vision, at first normal, may become constricted peripherally. By ' optic neuritis ' is signified a condition with but moderate and ' flat ' disc change ophthalmoscopically, with relatively early defect of vision, sometimes with scotomata. Histologically such cases exhibit the appearances of interstitial neuritis. If it is an axial neuritis (retrobulbar neuritis) a central scotoma is found, failure of vision is quick, yet the optic disc is normal ; on occasion however a retrobular neuritis may lead to papillœdema. The term ' papillitis ' should not be employed ; papillary œdema is a more non-committal expression.

The writer cites a considerable number of cases from the literature of epidemic encephalitis which prove the occurrence of papillary stasis in typical examples of the affection ; he also quotes examples of optic neuritis, and of retrobulbar neuritis. It is perhaps a little surprising to find how many cases have been described.

His personal cases consist of eleven with papillary stasis and seven with optic neuritis. Histological examination showed in one of the former the presence of numerous lymphocytic infiltrations in the sheath of the optic nerve, and in another there was thickening and a similar small-cell infiltration of the pia mater on the inferior aspect of the chiasma.

There is a good discussion of the differential diagnosis between epidemic encephalitis with optic nerve complications, cerebral tumour, and serous meningitis ('pseudotumor') respectively. The pathogenesis of the papillary changes is examined, and a long bibliography is appended.

J. V.

[107] **Chronic subdural accumulations of cerebrospinal fluid after cranial trauma.**—IRA COHEN. *Arch. of Neurol. and Psychiat.*, 1927, xviii, 709.

A PREVIOUSLY healthy young man, six weeks after a blow on the nose sustained while boxing, developed signs of a left cerebral lesion, with increasing papilledema. Operations disclosed a large subdural collection of xanthochromic fluid, with the entire frontal, motor and sensory cortex crowded into a space less than a fourth of what it should normally occupy. There was also a small amount of xanthochromic fluid beneath the dura of the right hemisphere.

During a four months' period, the left subdural space was more or less completely emptied nine times and more than 2,300 c.cm. of fluid were removed. Except for headache and papilledema, all signs of disturbed function soon disappeared. The headache and choked discs were relieved only after a right subtemporal decompression.

There was no evidence in the history to support the view that the brain shrinkage was in reality a congenital anomaly with a superimposed collection of subdural fluid caused by the trauma.

R. M. S.

[108] **Fracture into the frontal sinuses with discharge of cerebrospinal fluid for over a year.**—A. H. WOODS and F. L. MELENEY. *Arch. of Neurol. and Psychiat.*, 1928, xix, 694.

THE authors' patient was a woman, age 47, who sustained a fracture of the skull through both walls of the left frontal sinus and the roof of the orbit. The dura was torn and the inferior surface of the left frontal lobe lacerated. Three weeks after the accident the patient noticed a clear fluid dropping from her left nostril, and the escape continued, with intermissions of a few days, for at least thirteen months. The quantity of cerebrospinal fluid lost was not measured. Death ensued eighteen months after the accident from an acute fulminating meningitis. At the autopsy it was found that a part of the left frontal lobe of the brain had herniated into the frontal sinus. An encephalocele of this character does not appear to have been previously described.

R. M. S.

[109] **Encephalography.**—R. W. WAGGONER. *Amer. Jour. Med. Sci.*, 1927, clxxiv, 459.

THE author describes a method for introducing air into the spinal subarachnoid space in order to obtain rœntgenographic records of the cisternal, ventricle, and subarachnoid spaces.

XUM

The procedure is contraindicated in cases of posterior fossa neoplasm high intracranial pressure and recent cerebral hæmorrhage. The air must be injected slowly and in slightly less amount than the fluid removed. Films are taken at once. Valuable results are obtained in selected cases of neoplasm, in posttraumatic cases and in the differentiation of types of hydrocephalus. The obvious drawback of the method is that it is most dangerous in the very cases where it might be of most use—unlocalisable neoplasms with high intracranial pressure. P. W.

[110] **Syndrome of crossed choreiform hemiballismus from a haemorrhage in the corpus Luysii** (Sindrome de hemibalismo coreiforme cruzado por hemorragia en el nucleo hipotalamico).—CHRISTOFREDO JAKOB. *Archivos Argent. de neurol.*, 1928, ii, 1.

THIS is a valuable case, though the details are rather scanty. The patient was a man of 59, a cerebral arteriopath, in whom a sudden onset of violent choreiform movements (hemiballismus) occurred, some 12 days before death. The arm chiefly was implicated, on the left side, and the leg to a less extent. The movements disappeared during sleep ; the face was not involved. The motor agitation led to traumatic lesions of the skin, which became infected ; general toxicosis set in, and ended in coma and death.

A fresh hæmorrhage was found in the right regio subthalamica, destroying more or less completely the body of Luys, and spreading diffusely into neighbouring zones. There was also a recent hæmorrhage in the left cerebellar hemisphere, but it is stated to have been insignificant. The margin of the hæmorrhagic zone in the subthalamic region reached the nucleus ruber ; the substantia nigra was penetrated by an extension of the hæmorrhage, and rubolenticular radiations were affected. The zona incerta, too, was subjected to œdematous pressure. The cerebral peduncle was not directly involved, but the part traversed by the ansa lenticularis had undergone pressure.

The author unfortunately makes no attempt to explain the movements from the point of view of pathogenesis. He concludes with proper caution that the hemiballismal syndrome must not be set down exclusively to a lesion of the body of Luys (thus rather nullifying the title of his own article) ; he thinks the symptoms might equally well have been produced by the acute alteration of circulation in rubrolenticular radiations or in the fibres of the inferior hypothalamic radiation. He also admits that the red nucleus and the striate system in general may have contributed to the clinical syndrome, " indirectly," by inhibition of their functions. Finally, he allows that destruction of the body of Luys has been found without any hemiballismus whatever. He supposes that " an acute lesion " with " excitation of the region attacked," is necessary for its production. He refers to three more or less similar cases as being all he has found in the literature, but in this respect he has overlooked several more.

S. A. K. W.

[111] **Loss of affective tone and of consciousness during orgasm and laughter: gelolepsia and organolepsia** (Perdida del tono afectivo y del conocimiento durante el orgasmo y la risa—gelo y organolepsia).—J. ROTHFELD. *Archivos Argent. de neurol.*, 1928, ii, 200.

APART from the original cases described by Oppenheim under the term *Lachschlag*, and a few others mentioned in records of narcolepsy, little is known of the condition to which this paper is devoted. The case herein fully investigated is that of a man of 39, who for a number of years has suffered from attacks which supervene during the act of laughter. In these the limbs are relaxed and the patient is incapable of making the slightest movement, and in many there is definite loss of consciousness, yet only for a few seconds. Different degrees of severity of the attack have been observed. It may be accompanied by symptoms of acute anxiety amounting to a fear of impending death. On occasion it can be controlled by a sort of psychical inhibition; in the patient's words, "there is a fight between hilarity and serious thoughts, and if these win, the attack stops."

Precisely the same kind of seizure takes place during coitus; at the very moment when ejaculation is commencing he suddenly weakens all over, and becomes incapable of moving a single muscle; the jaw drops, he cannot utter a sound; further, he cannot continue intercourse, and the emission is either interrupted or ends automatically without any accompanying sensation. Only in rare instances, however, does any clouding of consciousness occur during a coitus attack. No other emotional state of the mind, such as anger, appears to be a precipitating cause. Somatic examination has proved entirely negative. Apparently no phenomena of abnormal sleep occurred in this case.

A long discussion on the nature and pathogenesis of the symptoms is supplied. In respect of attacks during coitus it seems to be unique.

S. A. K. W.

[112] **The pathogenesis of palato-phary-laryngeal paralysis** (Patogenesi del nistagmo palato-faringo-laringeo).—E. SIGNORELLI. *Riv. di pat. nerv. e ment.*, 1927, xxxii, 441.

PROFESSOR TORRINI has recently described an interesting form of paralysis agitans with no tremor in the limbs but with a tremor of the palate, pharynx, and larynx. A case of this kind has been fully studied both ante- and post-mortem by the author, who concludes that the lesion is an extrapyramidal one, with a double manifestation of symptoms—partly Parkinsonian (rigidity and hypokinesis), and partly pseudobulbar (tremor of the palate, pharynx, and larynx). The actual lesion is diffuse in character, of the senile type, with lacunar disintegration from symmetrical foci in the lenticular nuclei and cellular atrophy of the abiotrophic type in the grey matter in the substantia reticularis between mesencephalon and pons.

R. G. G.

XUM

[113] **A severe case of toxi-infective myelitis with widespread destruction of the spinal cord** (Ueber einen besonders schweren Fall von infektiös-toxischer Myelitis mit weitgehender Zerstörung des Rückenmarks).—J. SILBERMANN. *Zeits. f. d. g. Neurol. u. Psychiat.*, 1928, cxvi, 140.

ACCORDING to Dr. Silbermann cases of toxi-infective disseminated encephalomyelitis of unrecognised origin appear to be on the increase. Their occurrence after influenza, measles, chickenpox, or in association with tuberculosis, epidemic encephalitis, rabies, diphtheria, erysipelas, and other definite infections is well known, but in many more the pathogenic agent is never discovered. The same state of affairs is true for cases of pure myelitis. In this connexion special attention is drawn to the development of acute encephalomyelitis in relation to vaccination (a superinfection ?).

The case here described in great detail is that of a youth of 21, whose symptoms commenced with a sore throat ; a week later paræsthesiæ appeared in the legs and within twenty-four hours a complete flaccid palsy of these limbs, with loss of sensibility and sphincter paralysis, developed. In the course of another twelve hours the level in the spinal cord had risen to the upper part of the trunk, and later the neck muscles became weak ; the arms however were unaffected. After a stationary period of some weeks a left-sided facial palsy appeared.

Lumbar puncture proved negative ; the Wassermann test was negative in blood and fluid. Bedsores developed, and the patient became greatly emaciated. After remaining in a chronic state for over a year, he died.

Pathologically, the findings were those of disseminated myelitis, with ascending and descending degenerations and with extreme disintegration of the parenchyma more especially at the dorsolumbar level, rendering the usual anatomical landmarks unrecognisable.

Etiologically, three factors are accountable ; the patient's father was a tabetic with optic atrophy ; some infection was present in the shape of sore-throat and gingivitis ; and one week before these latter symptoms began the patient had a bad fall on his back when playing football. S. A. K. W.

[114] **Family spastic paralysis** (Paraplegia spinale spastica famigliare).—F. CASSINIO. *Riv. di pat. nerv. e ment.*, 1927, xxxii, 113.

THE author described the cases of two brothers who suffered from spastic paralysis. He enumerates the cases described in the literature, from those of Strümpell onwards, and points out that his cases agree in the main with the clinical picture of Strümpell's disease. He discusses the relationship with congenital diplegia (Little's disease) and stresses the difficulty of obtaining an accurate history of the exact age of onset and the dubiety of the underlying pathological state. He concludes that clinically the conditions cannot be distinguished. R. G. G.

[115] **Anaemic polyneuritis** (La polynévrite anémique).—L. VAN BOGAERT. *Annales de méd.*, 1927, xxii, 321.

A FEW writers who have occupied themselves with the problems of subacute combined degeneration and with those more generally of anæmia and the nervous system have observed symptoms of a peripheral type in the course of such affections, or have noted changes in the peripheral nerves on pathological examination. In their original paper (1900) Russell, Batten and Collier specially mentioned changes in both motor and sensory nerves, though these were stated to be a late development. Mathieu (1925) has recently adduced evidence to prove the existence of peripheral types of "neuro-anæmia," an anæmic polyneuritis occurring in a pure state, without spinal signs.

The author has seen six cases of subacute combined in four years, and one was purely polyneuritic in character; pathological examination showed no changes in the spinal cord, but typical neuritic alterations in the peripheral nerves. The case was that of a young woman of 22, with splenic anæmia who in the course of the illness developed all the symptoms and signs of polyneuritis. According to the author, this is proof of the existence of a neuro-anæmic syndrome entirely distinct from that of Lichtheim (subacute combined degeneration).

S. A. K. W.

[116] **The phenomenon of reflex adduction of the foot** (Sul fenomeno dell' adduzione riflessa del piede).—U. POPPI. *Il Cervello*, 1928, vii, 85.

IN 1913 Hirschberg noticed that if the skin on the inner side of the foot is stimulated a reflex adduction of the foot occurs, especially in cases in which the cortical motor area is involved. Pierre Marie concluded (1916) that the sign indicated the presence of cortical lesions more superficial than those giving rise to Babinski's sign. According to Neri (1920) percussion of the external malleolus leads to a similar adduction of the foot and is obtained thus with much greater readiness than if the skin be stimulated. His conclusion was that the movement is an osteo-periosteal reflex, rather than a cutaneous one. In 1913 Piotrowski observed that percussion of the tibialis anticus in its upper or middle third led in certain cases to plantar flexion of the foot; and Balduzzi (1925) obtained similar plantar flexion of the foot by striking the external malleolus. No little controversy has arisen since then in regard to these various techniques and movements.

As a result of numerous studies the writer of this article concludes that the phenomenon of reflex adduction of the foot, obtained by percussing the external malleolus, constitutes a "pseudo-inversion" of the normal reflex of plantar flexion of the foot. It is a sign of a pyramidal disorder and is especially observed in lesions of the cortical motor area, such as are not usually accompanied by Babinski's sign. It is not found in capsular hemiplegia; but it may coexist with Babinski's reflex in spinal cases. Thus its localising value when occurring alone is of significance for cerebral cases.

S. A. K. W.

PROGNOSIS AND TREATMENT.

[117] **The effect of bulbocapnine on the vestibular apparatus and the cerebellum in normal and diseased states** (L'influence de la bulbocapnine sur l'appareil vestibulaire et le cervelet chez l'homme normal et chez l'homme malade).—KAMIL HENNER. *Receuil de travaux en l'honneur du soixantième anniversaire du Prof. Lad. Syllaba*, Prague, 1928.

THIS important paper is written in the Czech language but there is a summary in French, from which the following generalisations are drawn.

Bulbocapnine exercises a favourable action on the majority of tremors of extrapyramidal origin, on idiopathic tremor, and on athetosis. In chronic epidemic encephalitis it appears to have an aborting action on oculogyric paroxysms. Nevertheless the drug aggravates generally the Parkinsonian syndrome of encephalitis and cannot be recommended for that affection.

It appears to be of service in cerebellar cases, especially in those with pronounced flaccidity and with abolition of simple reflexes of posture. The alkaloid is also a sedative, acting presumably on the cortex, and may prove to be of service in cases of obsession and of instability.

In experimental animals bulbocapnine can be shown to produce symptoms analogous to those of Parkinsonism and of catalepsy in man. In the ape and in the dog it can bring about an attitude in general flexion, with flexor rigidity, bradykinesia, catalepsy, ptyalism, and tremor at rest.

The author selected two normal human subjects, a patient with a traumatic cerebellar lesion, and two patients suffering from postencephalitic Parkinsonism; in them all a complete vestibular and cerebellar examination was made both before and after the administration of bulbocapnine.

(1) In the normal subjects the alkaloid produced a characteristic psychical effect; a "psychical viscosity" or "mental catalepsy" associated with a pleasurable feeling of calm (not as of fatigue), a sentiment of harmony in relations with the external world, without questions, problems, or doubts. Vestibular examination gave the Parkinsonian reaction of convergence (deviation inwards at the shoulder). Induced nystagmus was always reduced in range and time, and postrotatory movements of reaction were similarly reduced. The threshold for caloric nystagmus was greatly raised. In cerebellar tests segmental mobility was much reduced, a real plasticity sometimes taking its place. Postural reflexes were increased and lengthened. Many other cerebellar tests resembled those found in Parkinsonians, i.e., they were "inversely cerebellar." Much the most striking feature of the experiments was the effect of bulbocapnine in producing a state of akinesis; the subjects manifested a bradykinetic syndrome, with tendency to catalepsy; their facies was fixed; they could not turn their eyes readily from one object to another. They showed a surprising stability and absence of all appearance of muscular fatigue.

In a number of ways, therefore, the effect of the drug on normal subjects was to reproduce the clinical picture of postencephalitic Parkinsonism, though tremor was never observed.

(2) In the case of traumatic cerebellar lesion bulbocapnine had the effect of definitely diminishing the symptoms of cerebellar defect; the patient's maladresse disappeared and he became almost normal. It is of interest that he tolerated the alkaloid much better than he did scopolamine.

(3) As for the cases of chronic encephalitis, bulbocapnine accentuated all the symptoms of Parkinsonism without question; the patients simply became worse. It even made some latent Parkinsonian characteristics develop.

From his experiments the author concludes that Parkinsonism and cerebellar syndromes are "corresponding opposites."

S. A. K. W.

[118] **A new alkaloid (Banisterin) with action on the extrapyramidal motor system** (Ueber ein neues, auf das extrapyramidal-motorische System wirkendes Alkaloid [Banisterin]).—K. BERINGER. *Der Nervenarzt*, 1928, i, 265.

BANISTERIN is the name given to a new alkaloid obtained from an intoxicant known as "jagé," which is in use in Central and South America. The physiological and psychical effects of jagé are in many respects similar to those of mescal. The chemical firm of Merck supplied the author with preparations of banisterin and he has used them in some six cases of postencephalitic Parkinsonism, with excellent results as regards rigidity, involuntary movements, and muscular weakness. The drug can be given hypodermically, by the mouth, or in the form of a suppository. According to Merck its chemical formula is $C_{13}H_{12}ON_2$. Further investigation will be looked forward to with interest by all neurologists.

J. S. P.

[119] **The etiology and treatment of sciatica** (Los nuevos conceptos en la etiologia y en el tratamiento de la ciatica; la artritis vertebral causa de la neurodocitis ciatica).—JOSE VALLS. *Revista Oto-neuro-oftalmol.*, 1927, i, 160.

ATTENTION is specially directed to cases of sciatica occurring in patients with evidence of arthritis. Following Sicard, the author accepts the view that in many of these cases the part of the nerve that is involved is the section lying in the intervertebral canal (the "funiculus"—Sicard); the symptom is caused by a "funiculitis." The arthritic affection of the canal, implicating the nerve, leads to a "neurodocitis," by which is signified a mechanical irritation of the nerve in its intervertebral course. For several reasons it is precisely the fifth and fourth lumbar vertebræ which are especially apt to become affected by arthritic processes; and anatomical study has shown that the canals are

narrower here than at the levels immediately above. The funiculus is not covered by arachnoid in the canal, and there is no fluid round it, hence it is prone to suffer from extrinsic mechanical influences; at the same time the venous plexus round it is likely to become congested if inflammatory or infective processes exist in the vicinity.

Sciatica of this type is not associated with abdominal or inguinal pain, with sphincteric disorders, or with paralysis (as a rule); it does not occur before the age of 15; and there is no lymphocytosis in the spinal fluid.

Excellent results in treatment have been secured by a combination of radiant heat with immobilisation. With a Bier's apparatus dry heat is applied daily for 30 to 40 minutes to the proper area; some 18 to 20 applications commonly suffice. Immobilisation is effected by means of a corset of plaster for pelvis and trunk, leaving the limbs free. It is applied after the heat treatment has ceased. Some two or three months later it is replaced by one of celluloid; six months, or more, up to a year, complete the course. In more than 300 cases the author has had gratifying success.

S. A. K. W.

Endocrinology.

[120] **The influence of the thyroid on character** (La tiroide e la sua influenza sul carattere).—C. E. Roberti. *Riv. di pat. nerv. e ment.*, 1927, xxxii, 125.

The author discusses the three pathological conditions of thyroid activity, viz., hypothyroidism, hyperthyroidism, and dysthyroidism. He deals with their relation to character and concludes that the hypothyroidic subject exhibits affective stability, slight excitability, and a certain slowness in all the nervous processes, while the hyperthyroidic shows an increase in general excitability, an instability of mood, and a great liveliness of emotion.

These characteristics may paradoxically coexist in the same person, and the combination corresponds in a wide sense to what is found in dysthyroidism.

R. G. G.

[121] **Epilepsy and the endocrines.**—J. C. Partridge. *Amer. Jour. of Psychiat.*, 1928, viii, 137.

From a study of the ages of onset of epilepsy taken from the histories of 7,200 admissions to Craig Colony, New York, it is evident that there are two periods of life wherein the greatest number of cases of epilepsy develop; viz., the first four years of life, and puberty. Were there only the one group of early life one might attribute the affection to some structural change of the nervous

system, but when the group occurring at puberty is considered it would seem that the endocrine system offers the best field for study. Inasmuch as menstruation is known to be intimately associated with the endocrine system, an effort to demonstrate endocrine dysfunction was made by the study of the menstrual records of 124 female patients over a period of five years. The minimum age at the beginning of this period was 15 years and the maximum age at the end was 35 years. A perusal of these records would convince the most sceptical that irregularities of menstruation are very common. The percentage was well over 50. A similar group of normal females for comparison with the above was not available but it is argued that among them no such high percentage of irregularities would be found. The author, however, does not attempt to prove that epilepsy is caused by endocrine dysfunction.

C. S. R.

[122] **Lipodystrophia progressiva** (Bemerkungen zur Frage der Lipodystrophia progressiva, zugleich Mitteilung eines Falles mit Hypertrophie eines Beines).—J. WILDER. *Zeits. f. d. g. Neurol. u. Psychiat.*, 1928, cxvi, 275.

THE case described by the author does not correspond in its entirety to the usual clinical picture of lipodystrophia progressiva; there was a striking 'adipositas' (not, however, 'dolorosa') of the lower part of the trunk and of the lower limbs, the right being hypertrophied. By way of etiology the author incriminates the ovarian system ("ovarian dysfunction"). In the upper part of the body, shoulders and face, was some fat shrinkage (not particularly noticeable in the photographs), the cause of which is unknown; the fatty hypertrophy of the other parts is declared to be associated with the ovarian involution already mentioned. Two types are said to be distinguishable; the infantile (mainly lipoatrophy) and the juvenile (mainly lipohypertrophy).

S. A. K. W.

Psychopathology.

PSYCHOSES.

[123] **Dementia praecox and vitamins.**—W. REES THOMAS. *Jour. of Ment. Sci.*, 1928, lxxiv, 460.

FROM many careful experiments this author concludes that irradiated ergosterol causes a reversal of the abnormal blood reaction known as the hæmoclastic crisis in cases of dementia præcox, and the dose required to establish a permanent reversal is 2 mgrm. (1.33 gr.). There was no evidence in control cases of any deficiency of vitamin D obtained from the skin and from the food supplied. Ultra-violet radiation does not increase the production in the body of vitamin D sufficiently to produce a reversal of the reaction, and the quantity

thus provided appeared to be roughly equivalent to 1 mgrm. of irradiated ergosterol. The vital significance of this vitamin to the body economy suggests the possibility of some relation between it and mental disorder, either directly or through some as yet unknown function of the liver.

C. S. R.

[124] **Obsessions and dementia praecox** (Obsessions et démence précoce).—C. HALBERSTADT. *L'Encéphale*, 1928, xxiii, 128.

THE case described is that of a woman of 30, with a poor family history (aunt insane and schizophrenic ; sister, manic-depressive psychosis). She presented typical symptoms of hebephrenic dementia præcox, and in addition a whole series of phobias and obsessions. Cases showing this particular combination are rare, that is, as far as the clinical coexistence of the two is concerned. Only a few have been recorded in the literature (Bleuler, Kraepelin and Lange, Kaan, Pilcz, and one or two more). In connexion with the appearance of such compulsive ideas in the course of schizophrenia the following three questions deserve consideration :

(1) Are genuine obsessive ideas found in the course of dementia præcox ? The answer must be in the affirmative.

(2) Have such ideas any relation to catatonic symptoms that are accompanied by a subjective feeling of obsession ? Possibly, just as acts consecutive to an obsession may be transformed into a stereotypy of dementia.

(3) Is there any etiological factor linking certain cases of obsessional neurosis and schizophrenia ? This is as much denied as accepted. Halberstadt will not concede that his patient was suffering from two separate mental states, but holds the view that in true dementia præcox obsessional symptoms may occasionally be found, just as they may be in manic-depressive psychosis.

J. S. P.

[125] **The adrenalin blood pressure curves in dementia praecox and the emotional psychoses.**—LEO KANNER. *Amer. Jour. of Psychiat.*, 1928, viii, 75.

THIS investigator found that all of thirty-four selected cases of dementia præcox after injection of 1 c.c. of adrenalin solution (1/1000) yielded typically vagotonic blood-pressure curves. The degree of vagotonia as pictured by the curves did not seem to depend upon certain " types " of dementia præcox, but upon the degree of emotional indifference. Conditions of acute excitement, formed, in addition to the adrenalin, a stimulus to the sympathetic. Five cases of manic excitement or depressive agitation yielded typically sympathicotonic curves. Three cases of stuporous melancholia presented pronounced vagotonic curves. In the author's opinion, the adrenalin blood pressure test should be made a routine examination both in cases of dementia præcox and the emotional psychoses.

C. S. R

[126] **A contribution to the pathogenesis of the syndrome of amentia and schizophrenia** (Contributo alla patogenesi delle sindromi amenziali e schizofreniche).—C. E. ROBERTI. *Riv. di pat. nerv. e ment.*, 1927, xxxii, 564.

AFTER a consideration of various theories and a close examination of twenty cases the author considers that the secret of the pathogenesis of these conditions is to be found in lesions and dysfunctions of the intestinal tract.

R. G. G.

[127] **Filterable virus and mental diseases** (I virus filtrabili e le malattie mentali).—M. CAMIA. *Riv. di pat. nerv. e ment.*, 1927, xxxii, 46.

FROM a comparison of the symptomatology and course of the two diseases, dementia præcox and encephalitis lethargica, the author suggests that the former as well as the latter may be caused by a filterable virus.

R. G. G.

[128] **Reactions in the urine of aments and dementia praecox cases** (Reazione nera, reazione dell 'uroroseina, reazione di millon nell'urina di amenti e dementi precoci).—E. SCHEINER. *Riv. di pat. e nerv. ment.*, 1927, xxxii, 544.

THE ' black reaction ' is not due to the increase of uric acid or the diminution of chlorine in the urine. Aromatic bodies are present which, when isolated, and in the presence of traces of free ammonia, give a black precipitate with silver nitrate in heat.

The urorosein reaction is constantly present in the urine of aments, of dementia praecox cases and of cases of alcoholic dementia, and is due to functional alteration in the liver following the intestinal lesions which have been demonstrated by Buscaino, Mazzanti and Roberti.

The reaction of Millon is constantly found in the urine of aments, in acute dementia præcox cases and in those of alcoholic dementia. These reactions are not due to phenol free in the urine, to aromatic oxyacids, or to tyrosine, but probably to a derivative of tryptophane, with an oxyhydric group in the benzine ring. This substance is a chromogen. R. G. G.

[129] **Menstruation in relation to mental disorders.**—F. H. HEALEY. *Jour. of Ment. Sci.*, 1928, lxxiv, 488.

A STUDY of the menstrual histories in 443 cases with psychoses of some duration shows that increase of excitement is the commonest change, occurring in about one half. In established cases of psychosis amenorrhœa occurs roughly in the proportion of 1 in 7 cases, while dysmenorrhœa reaches the high proportion of 1 in 5 cases. Menorrhagia occurs in 12 per cent.

Many writers have appreciated the fact that epilepsy is influenced by menstruation. Statistics show marked increase in the female cases in the second and third decades of life at the time when the menstrual function is in

evidence. Epilepsy may begin with the first menstrual period, and in certain cases may cease at the climacteric. There are records where fits occurred at irregular intervals, to be grouped at the premenstrual period or at the onset of menstruation. There has been much speculation as to the cause of this association. In 72 cases studied by the author it was seen that a high percentage show the premenstrual or menstrual grouping of the fits and that dysmenorrhœa is very common among epileptics. The continuance of the fits beyond the menopause is thought possibly to be due to the formation of the fit habit, overruling the endocrine change. C. S. R.

PSYCHOPATHOLOGY.

[130] **Investigation of the acid-base balance in mental cases, with special reference to epilepsy.**—Geoffrey Shera. *Jour. of Ment. Sci.*, 1928, lxxiv, 454.

In the search for somatic disturbance in connection with the insane, either as a cause or as an effect of mental disorder, the acid-base balance has afforded a field of exploration from time to time. Epilepsy, in particular, has provided material for research on these lines. Notwithstanding the hitherto negative character of the results of acid-base studies in epilepsy, it was thought worth while to investigate a number of unclassified new admissions in respect of their acid-base equilibrium and also to compare them with epileptics, and to investigate the reaction of the blood, particularly the alkali reserve, in relation to the fit. Actually some valuable information has been thus obtained which also throws light upon the usefulness of institutional treatment in the early stages of the mental disorder.

All experiments were performed twice on the same specimen, and any inconsistent results were discarded. As compared with the normal subject, the new admissions and chronic cases show a distinct average tendency to acidosis, whereas the epileptics deviate but little from the normal. This points to epilepsy as a disorder in which the disturbance of nutrition and metabolism generally is decidedly less than that of the average mental patient who definitely shows signs of mild acidosis. In relation to meals no pathological variations occurred. In relation to fits, there is in the majority a tendency to alkalosis. There is thus no marked deviation from the normal alkali reserve in epilepsy, which is a remarkable tribute to bodily powers of adjustment under severe stress. Acidosis in new admissions was investigated by means of the blood. In 34 cases there was an abnormal acidosis ratio in 4 cases (9 : 1, 6·65 : 1, 9·6 : 1, 9·02 : 1) which shows a small but definite percentage of relatively severe acidosis apart from the general average of mild acidosis. In new admissions previous malnutrition as a result of difficulty in feeding may have led to starvation acidosis. On the other hand this will not explain why the chronic case should show a tendency to acidosis. It may be that some depletion of the alkali reserve is an accompaniment of chronic mental disorder with the exception of epilepsy, possibly as a result of toxæmia (dental or alimentary),

or as a result of disordered endocrine metabolism. At any rate, this alteration affords one more instance of faulty metabolism, and in order to guard the patient from further somatic damage the building up of the alkali reserve should, where indicated, be undertaken by means of alkali treatment.

C. S. R.

[131] **Syphilis and epilepsy.**—H. A. PATTERSON. *Amer. Jour. of Syphilis*, 1928, xii, 41.

THIS paper analyses the results of blood Wassermann reactions on 2,240 epileptic patients in the Craig Colony during a period of eight years. Forty-one patients gave positive reactions, a percentage of less than two, which is much below the average for the general population. Syphilis appeared to be a factor in the causation of epilepsy in only a small proportion of the infected cases. "In those instances where it assumes an etiologic role the syphilis precedes the epilepsy; in those instances where it appears as an incidental element the syphilitic infection is, as far as could be ascertained, likely to run its course independently of the epilepsy. In the former event antiluetic treatment seems decidedly beneficial in ameliorating the consequent convulsive disorder. In the latter event the effect of the antisyphilitic treatment on the course of the epilepsy is very dubious."

J. G. G.

[132] **The sedimentation test: its use as a routine procedure in psychiatric institutions.**—JACOB GOLDWYN. *Amer. Jour. of Psychiat.*, 1928, viii, 59.

THE writer and his co-workers have found this test of practical value in detecting the presence of many somatic disorders, especially in dealing with uncooperative mental patients. The test may be likened to the leucocyte count. The white count varies under normal conditions; it is increased in many diseases, yet not all pathological processes are accompanied by a leucocytosis. So with the sedimentation reaction; it varies with normal limits; it is increased in many disease processes; however, there are many diseases in which the readings remain unchanged. As with the leucocytes, an increased sedimentation reaction, unless due to error of technique, *always* indicates a pathological state. On the other hand, a normal reaction does not exclude disease. Because the sedimentation reaction is helpful in determining the diagnosis, the differential diagnosis, and the progress of many mental and physical diseases; and because it is an efficacious and reliable detector of many pathological conditions, especially in dealing with the insane, it is of sufficient practical and clinical value to warrant its use as a routine procedure in psychiatric institutions. In a series of over 200 cases it was concluded that the acceleration of the erythrocyte sedimentation reaction varies directly with the amount of mental deterioration, the amount of organic destruction, and the amount of toxicity present. Unless complicated by physical disease, the test reactions are normal in cases of manic-depressive psychoses, psychopathic

personalities, psychoneuroses, and paranoia. Increased readings are found in all cases of senile psychoses, psychoses with arteriosclerosis, general paralysis, neurosyphilis, psychoses with mental deficiency, psychoses with somatic disease, acute types of alcoholic psychoses, in many cases of epileptic psychoes, and involutional melancholia. In dementia præcox the findings in the simple and paranoid types tend to give normal readings, while the hebephrenic and chiefly the catatonic types tend to give slightly accelerated reactions. Cases with marked mental deterioration give increased readings. No cases of dementia præcox gave a marked increase unless complicated by some physical disorder.

C. S. R.

[133] **The psychopathology of suicide** (Zur Psychopathologie des Selbstmordes) —E. WEXBERG. *Der Nervenarzt*, 1928, i, 288.

THIS article contains an account of the case of a young woman of 21, in which treatment along the lines of the individual psychology of Adler was followed by a cure (" Eine Gefahr des Selbstmordes besteht heute nicht mehr "). Stress is laid on the importance of familiarising the public with the usefulness of psychotherapy in cases of suicidal intention, at least in those of a milder type, characterised by hesitation and indecision. The conclusion of such patients, that their life conflict is insoluble, is nothing else than a tragic error, which can be corrected by the psychotherapist.

J. S. P.

[134] **Manic excitement and cerebral tumour** (Excitation maniaque et tumeur cérébrale).—H. CLAUDE and H. BARUK. *L'Encéphale*, 1928, xxiii, 9.

THE patient was a woman of 52, who was sent to an asylum because of attacks of mania, with delusions of persecution. For some six years previously she had suffered from increasing headache, of migrainous type, occasionally associated with vomiting; at every menstrual period the headache had been " frightful." Later, vertigo accompanied it. At one time, apparently, a suspicion of papilloedema was remarked, but other examinations showed the optic discs to be normal. When the patient came under observation mental symptoms dominated the picture. There was more or less continuous motor agitation, with violence on occasion; flight of ideas; ' klang '-associations in speech, which was often facetious, caustic, ironical, by turns; sometimes almost a glossomania was noted. Neurological examination did not reveal any abnormality.

Post-mortem a large tumour was found in the right temporo-occipital region, which histologically proved to be a meningioma of the psammoma variety.

In the authors' experience a clinical syndrome of this kind is very rare in cerebral tumours; more commonly it belongs to the type of moria. Further, no strict connexion can be established between maniacal syndromes and lesions of the temporal region.

J. S. P.

[135] **The physiology of psychic processes** (La fisiologia dei processi psichici). —E. SCHEINER. *Riv. di pat. nerv. e ment.*, 1927, xxxii, 349.

THIS paper, after referring to Sherrington's work on the integrative action of the nervous system, summarises in some detail the work of Pavlov and his pupils on conditioned reflexes. The author deals with the importance of inhibition in relation to sleep and refers to the conclusions of Smolensky on the importance of alterations in conditioned-reflex formation in the production of the symptoms of psychasthenia, paranoia, mania, etc.

He points out that many of the conclusions drawn as to human behaviour from the study of conditioned reflexes are only analogies and therefore must be received with caution. R. G. G.

[136] **Psychopathic personalities among boys in a training school for delinquents.**—G. E. PARTRIDGE. *Amer. Jour. of Psychiat.*, 1928, viii, 159.

THIS is a report of an investigation of a group of fifty boys of a training school for delinquents referred to the psychiatric clinic as especially problematic. The study of these cases showed that in the most numerous sub-group behaviour difficulties and ill-adjustment in general were related to mental retardation or deficiency. In twenty-four the intelligence quotient was 75 or below. In none of these cases (with three possible exceptions) was found the characteristic picture of psychopathic personality. The median intelligence quotient of the psychopaths was 87 as compared with 77·5 of the whole group of fifty cases. The main picture shown by the delinquent defective boy among these cases was that of somewhat inhibited demand and a personality characterized by good-nature, pleasure-seeking, and simplicity of conduct, although there may be some signs of timidity. In the more unstable mentally deficient there were the types of behaviour that are related to the anger reactions, such as bad temper and excitability, but none of the persistent behaviour patterns as found in the developed psychopath. A composite picture of the twelve psychopaths showed a prevalence of antagonistic attitudes toward a parent or parent substitute, sensitiveness, restlessness, marked social difficulties, compensatory actions such as lying and stealing, nervousness, bashfulness, and various evidences of ill-adjustment and feelings of insecurity. Among them was found no "lack of moral sense," but there was a tendency to ignore the interests of other people because of the ardour of their own desires. It is among the mentally deficient that the more typical amoral and irresponsible person is found. C. S. R.

[137] **Regressio mentis infanto-juvenilis** (Dementia infantilis).—G. CORBERI. *Riv. di pat. nerv. e ment.*, 1927, xxxii, 301.

THE author seeks to establish a clinical entity under the above name. This condition starts in early childhood in subjects who up to the time of onset have seemed perfectly normal, and progresses to a grave degree of mental

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deficiency with loss of speech. It is distinguishable from ordinary mental defect, from juvenile general paralysis, from epileptic dementia and from dementia præcocissima. It is nearly related to amaurotic family idiocy, but blindness does not occur. Two cases are fully described. The whole family except the father gave slightly positive Wassermann reactions; in the case of the latter the test was negative. This makes it doubtful whether syphilis had anything to do with the condition, especially as the examination of the spinal fluid was negative for all tests indicating spirochætal activity. After discussion the author concludes that the morbid process is of the nature of acute diffuse lipoidal neurolysis.

R. G. G.

[138] **The heredity of instinctive perverts** (L'hérédité des pervers instinctifs). —Georges Heuyer and M. Badonnel. *L'hygiène mentale*, 1928, xxiii, 125.

From their work done among youthful delinquents, the authors conclude that it is not possible to deny the role of heredity in the genesis of the instinctive perversions of childhood. They cannot admit the theories derived from psychoanalysis which negate the importance of constitutional hereditary tendencies and which in particular consider perversions as psychopathic states determined by a disordered childish affective life. It is not denied that in certain cases psychoanalysis will bring to light an inferiority or an Œdipus complex, but this does not explain the mechanism of perversions. In order that complexes can play a part in the mind of the child there must exist a hereditary predisposition, that is to say, tendencies which manifest themselves precociously in the individual and which in their essence persist all through life without modification. Freud himself admits such a predisposition but his pupils, more Freudian than their master, deny such a factor. The question is important, for if the moral perversions of the child are acquired and determined by affective conflicts, an adequate education can prevent them and analysis can cure. Healey has shown that 60 per cent. of a group of children submitted to correctional methods gravitated later towards crime, but he makes the gratuitous statement that a large number of them would have evolved differently had they been better understood and their individual needs been elucidated early. If it is a question of instinctive perverts, all psychotherapy, all psychoanalysis and all education will in no way modify their harmful tendencies. Where individual psychotherapy and psychoanalysis fail, social measures may play a considerable preventible role: if they do not suppress the perversions, they prevent them realizing themselves. Moreover, specific systematic treatment in certain cases gives remarkable results, but it is doubtful how much such measures are only palliative or feebly curative. The study of the heredity of perverts show that efficacious measures must be preventive and eugenic.

C. S. R.

PROGNOSIS AND TREATMENT.

[139] **The treatment of general paralysis.**—C. B. Bamford. *Jour. of Ment. Sci.*, 1928, lxxiv, 496.

Intensive and systematic treatment has been carried out at the Rainhill Mental Hospital in 1927. Out of the 46 treated cases 25 per cent. have been already discharged. In another 30 per cent. distinct improvement has been effected, while of all the cases treated less than 12 per cent. have failed to improve.

From this work the following conclusions have been arrived at. It is essential to have the clinical diagnosis of general paralysis confirmed by serological examination. If such examination is carried out early, the disease can no longer be looked upon as hopeless, because intensive treatment does effect immediate improvement. It should consist of one full course of tryparsamide (ten weekly injections of 3 grm. each), followed by a series of malarial rigors—twelve if possible. For various reasons this sequence is regarded as better than the reverse order, i.e., malaria followed by tryparsamide. The gold-curve is little, if at all, affected by therapeutic measures. This test, being the most stable, is of primary diagnostic importance. All cases which improve clinically with treatment have shown corresponding serological improvement, but the converse has not been established. Changes in the cerebrospinal fluid have followed much more consistently upon the administration of tryparsamide than upon that of malaria. In other words this investigation demonstrates that serologically tryparsamide is a more potent therapeutic agent than malaria.

C. S. R.

[140] **Radiological castration in cases of degenerative psychosis** (Röntgenkastration bei degenerativem Irresein).—H. D. v. Witzleben. *Der Nervenarzt*, 1928, i, 297.

The first case was that of a woman of 47, who had been ill for 20 years and sojourned in more than one institution. Clinically, her case had been diagnosed as degenerative hysteria, or as psychosis. Throughout, hypersexuality had been a prominent symptom. At the request of the patient's mother castration by X-ray radiation was tried, the idea being to render the ovaries atrophic. The hope was not unjustifiable, inasmuch as many of her psychotic symptoms were aggravated during the catamenial flow. Treatment, however, proved a failure, although it is claimed that slight amelioration took place.

The second was that of a woman of 44, who had shown hysterical traits in early life and whose condition was suggestive of a degenerative psychosis. She pestered doctors and nurses with stories all of which were of a sexual kind, and declared that only by sexual intercourse would she ever recover.

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In this case also X-ray radiation of the ovarian region failed to effect any clinical result. Although treatment was disappointing, the writer of the article evidently believes that the method deserves a further trial in selected instances.

J. S. P.

[141] **Child psychoanalysis** (La psychanalyse infantile).—SOPHIE MORGENSTERN. *L'hygiène mentale*, 1928, xxiii, 158.

CLINICAL experience shows that childish neurotic troubles arise from a familial conflict—the birth of a little brother or sister, the unhealthy love of a son for his mother, hatred for the father rival, who is the symbol of all power, who can punish and humiliate his son. Sometimes it is a question of jealousy towards a more gifted brother or sister, with a resulting feeling of inferiority. A constitutional disposition is not sufficient to hatch a neurosis, but the personality of the father and mother and their bearing towards the child play the most important role. A tyrannical father, a mother who is indifferent or too much attached to the child can bring about the gravest disorders. Examples are cited to show that the child neurosis is an actual neurosis and that there is no need to penetrate into the unconscious to reach the origin of the trouble. Cure is more assured than in an adult and the duration of treatment ought not to be long. Treatment of the neuroses of childhood would contribute much towards the diminution of those in adult years.

C. S. R.

[142] **Experimental aseptic meningitis: therapeutic and clinical studies.**—P. E. KUBITSCHEK and F. A. CARMICHAEL. *Amer. Jour. of Psychiat.*, 1928, viii, 97.

FROM their work the writers conclude that intraspinal injection of horse serum produces a strong stimulation of the body defensive mechanism, the intensity of the reaction being localized to the cerebrospinal system. Development of aseptic meningitis produces temporary improvement in a large percentage of both chronic and early cases of dementia præcox and other psychoses. The incidence and degree of permanent improvement are much greater in dementia præcox of early stages than in the chronic, deteriorated types. Aseptic meningitis as a therapeutic measure is of little value in the treatment of chronic dementia præcox. It seems to be of definite value in certain cases of early dementia præcox and in psychoses of toxic and infectious nature.

C. S. R.

Reviews and Notices of Books.

Report of an Inquiry into the After-histories of Persons attacked by Encephalitis Lethargica. By ALLAN C. PARSONS, M.R.C.S. (Reports on Public Health and Medical Subjects, No. 49). London: Ministry of Health. 1928. Pp. 204. Price 4s. 6d. net.

DR. ALLAN PARSONS has accomplished an eminently utilitarian if somewhat tedious task in collecting and analysing the data obtained from an extended series of inquiries concerning the after-histories of patients who have had an attack of epidemic encephalitis. It is based on information received in respect of no fewer than 3,500 persons—forming about one-fifth of the total number of notifications between January 1919 and December 1926. Amid so much highly complex analysis and synthesis it is convenient to be able to abstract a general conclusion, which can be expressed as follows: If say, 100 cases are investigated three years after the primary illness, then of their subjects 25 will be found to have survived without serious consequence; 35 will have died; and 40 will have become more or less disabled in mind or body, or both.

The sequelæ of the disease are classified for clinical and statistical purposes in a practical fashion, and tables are given from which the comparative frequencies of these can be ascertained. A loose division into physical sequels, mental changes, and moral effects, can be adopted. Of 995 patients under the age of 16 at time of onset or of notification 65 (6·5 per cent.) developed Parkinsonism, a percentage almost identical with that among 1,483 patients over the age of 16 at the time of onset. Among the 995 mentioned above, 181 (18·2 per cent.) subsequently developed changes of character, but only 5·7 per cent. of the 1,483 over 16 did so. But when a series of 925 patients of all ages was taken, no fewer than 334 (36·1 per cent.) were found to have become Parkinsonians, and according to Dr. Parsons this figure is probably an understatement, for it does not include patients who died of Parkinsonian complications. In a series of 31 cases of Parkinsonism 19 (61 per cent.) of the patients were under the age of 30. Much useful information will be found in this Report on the average course and progress of these types of case, and much, too, on the topics of the mental and moral sequelæ.

The question of care and treatment, institutional and otherwise, also receives considerable attention.

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Handbuch der Neurologie des Ohres. Edited by PROF. DR. G. ALEXANDER, PROF. DR. O. MARBURG, and DR. H. BRUNNER. II Band, 1 Hälfte. With 155 illustrations, some in colours. Berlin and Vienna: Urban and Schwarzenberg. 1928. Pp. 720. Price Mk. 75; bound, Mk. 81.

ON previous occasions we have reviewed other volumes in this superb encyclopædia of neurological otology, which has set a high standard in regard to both comprehensiveness and erudition. The part now issued deals with a series of special subjects. The first is that of the involvement of the fifth and seventh cranial nerves in affections of the external and middle ear, being concerned mainly with otogenic facial palsy and with otogenic facial neuralgia. A somewhat neglected subject is that of congenital malformations of the ear, with accompanying neural phenomena, and this is well handled by Dr. O. Benesi. Some thirty pages are assigned to deaf-mutism. The condition of the auditory apparatus in various heredodegenerations such as Friedreich's disease, amaurotic family idiocy, tuberous sclerosis and so forth is fully described in a section which embodies much useful information.

A considerable part of the volume is taken up with the question of trauma of the ear and its connexions; commotio cerebralis, fracture of the base, explosions, and compressed air affections, are among those dealt with, as is also that of direct wounds. All of these sections reach a high level of medical writing and are replete with valuable information collected from widely scattered sources. Professor Kobrak describes the affections of the blood-vessels of the labyrinth, and Professor Stiefler the auditory semiology of vascular disease in brainstem and cerebellum.

The printing is beautifully clear, on fine paper, and the diagrams and photographs are well reproduced. This encyclopædia is one of the handsomest and best productions of the Viennese school of medicine.

L'Architecture Cellulaire Normale de L'Ecorce Cérébrale. By CONSTANTIN V. ECONOMO. With 61 illustrations. Paris: Masson and Co. 1928. Pp. 183. Price 80 fr.

THIS is a French translation of von Economo's small book on the cell structure of the cortex. The only departure that the translator has made is in adding paragraph headings in leaded type, a change which increases the value of the book as a work of reference. The book begins with a description of the main cortical types and of their distribution in the various regions of the cortex. One hundred and nine types are described, but they are grouped in five main forms which are easily distinguished on histological grounds. He also adopts a new system of nomenclature for the various areas, retaining an indication of the lobe, frontal, temporal, occipital, etc., by a preliminary letter F, T, O, followed by letters A to H which indicate the anatomical position in the lobe. Thus we get, e.g., P, E, m, which is equivalent to fifth parietal area, type magno-cellularis.

The main cortical areas are then more exactly described with the help of 46 full-page microphotographic plates.

The book should be of great value to those studying the pathology of the cortex and to the more serious students of the anatomy of the nervous system.

J. G. G.

Les Nouvelles Methodes sur Les Réactions colloidales du Liquide cephalo-rachidien. By EUGENE DE THURZO. Paris: A. Maloine. 1927. Pp. 182. Price not stated.

THIS little book describes two new colloidal reactions for the cerebrospinal fluid, the bi-colour benzoin and bi-colour mastic reactions. In these, an acid and a basic dye are added to the resinous suspension, acid fuchsin and light green to the benzoin and acid-fuchsin and naphthal B-green to the mastic. Shellac has been employed by Marchionini as an alternative to the gum mastic. The advantages claimed for these reactions are increased sensitivity and ease of reading.

Other well known colloidal reactions, such as Kafka's paraffin reaction, the "normo-mastic" of Jakobsthal and Kafka, and the Sicard-Haguenau modification of the colloidal gold reaction are described and the result obtained by the various reactions discussed.

The book is illustrated with several colour plates and contains numerous tables. It forms a useful addition to the literature of the cerebrospinal fluid.

J. G. G.

Die Psychischen Heilmethoden für artzliches Studium und Praxis. Edited by Dr. KARL BIRNBAUM. Leipzig: Georg Thieme. 1927. Pp. 462. Price M. 21.

THIS is a comprehensive systematic account by six authors of the principles and practice of the chief forms of psychotherapy in use at the present day. Birnbaum writes a general and theoretical introduction, Jolowitz deals with suggestion therapy, Heyer with hypnotic methods, von Hattingberg with psychoanalytic and related methods, Wexberg with Adlerian principles and practice and Kronfeld with "Psychagogics." The theoretical expositions that precede each part are necessarily of a summary nature, but they are for the most part clear and simple. The chief differences in the viewpoints of the various schools are clearly set forth and the book should form a valuable groundwork for the practitioner who wishes to include in his therapeutic armamentarium, psychological resources of various kinds. Experience alone and not even a comprehensive work of this sort can teach him in what particular case to apply the appropriate method.

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Diagnostic et Thérapeutique par le Lipiodol. By J. A. SICARD, Professor in the Faculty of Medicine of Paris, and Dr. J. FORESTIER, Aix-les-Bains. With 49 illustrations. Paris: Masson & Co. 1928. Pp. 370. Price 50 fr.

DR. FORESTIER and Professor Sicard have been the pioneers in the application of lipiodol technique to problems of diagnosis and treatment and it is proper that they should have collaborated in the production of this extremely useful and interesting book. While it deals to a large extent with matters outside the province of the neurologist, he will nevertheless turn to the sections that concern the employment of lipiodol in the subarachnoid space and find abundant material from which to receive instruction. Technical methods, general rules, dangers, are minutely described; specific applications are examined seriatim. The interpretation of results (radiological and otherwise) is particularly well done. A large number of excellent X-ray photographs are reproduced, and there is an amazing bibliography taking up nearly 70 pages. The use of lipiodol is *à l'ordre du jour*, and this book has appeared exactly at the right time.

A B C of Adler's Psychology. By PHILIPPE MAIRET. London: Kegan Paul. 1928. Pp. 116. Price 3s. 6d. net.

AN unpretentious little book, this Adlerian primer contains the gist of Adler's doctrines and the cream of his practice. Here are duly set forth, in simple language, the principles with which his name is associated. In every individual is found an individual way of selecting his experiences from all possible experience; the principle of selectivity is one of consciousness of a need, to compensate some specific inferiority. The sexual life is far from controlling his activities. The individual's psychology is rooted in his biology. Compensation, long recognised as a biological principle, is applicable fundamentally also to psychology. Here, too, is clearly expounded the goal to which the individual moves, his place in the community of thinking beings; and the corollary, that all psychopathology is of the nature of egoism. A final chapter is concerned with the conduct of life.

This slender little book is well worth reading and pondering over.

Morpheus, or the Future of Sleep. By D. F. FRASER-HARRIS, M.D., D.Sc., formerly Professor of Physiology, Dalhousie University, Halifax, Nova Scotia. London: Kegan Paul. 1928. Pp. 94. Price 2s. 6d. net.

IT is perhaps not an easy task to write of sleep entertainingly and at the same time technically for an audience whose knowledge of physiology may be accounted nil. Professor Fraser-Harris supplies delightfully the literary touch and the humorous understanding, and it is churlish on our part to suggest that the physiological counterpart may leave a feeling of dissatisfaction. With his strictures on the "phono-purgatory" of life in a modern crowded city we are in complete accord; they are no more than the dictates of common sense, and it is high time our municipal authorities gave them attention. Any step that will ensure auditory repose will be as welcome as it is overdue.